FCC TEST REPORT

For

Mobile Phone

Model Number: CPH2477

FCC ID: R9C-22263

Report Number : WT238000023

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
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Revision History

No	Date	Remark
V1.0	2023.02.03	Initial issue

TEST REPORT DECLARATION

Applicant	:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	:	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China
Manufacturer	:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	:	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China
EUT Description	:	Mobile Phone
Model No.	:	CPH2477
Trade mark	:	OPPO
Serial Number	:	/
FCC ID	:	R9C-22263

Test Standards:

FCC Part 15 Subpart E 15.407

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.207, 15.209 and 15.407.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	周芳媛	Date:	Feb.03, 2023
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Checked by:	万晓婧	Date:	Feb.03, 2023
	(Wan Xiaojing 万晓婧)		
Approved by:	林奕翔	Date:	Feb.03, 2023
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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
6dB Bandwidth	FCC §15.407 (e)	Pass
26dB Bandwidth	FCC §15.407 (a)	Pass
Maximum Peak Conducted Power	FCC §15.407 (a)	Pass
Maximum Power Spectral Density Level	FCC §15.407 (a)	Pass
Radiated Bandedge and Spurious	15.407 (b) 15.209 15.205	Pass
Conducted emission test for AC power port	15.207	Pass
Antenna Requirement	15.203	Pass

Remark: “N/A” means “Not applicable.”

2. GENERAL INFORMATION

2.1. Report Information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3. Measurement Uncertainty

Conducted Emission
9 kHz~150 kHz *U*=3.7dB k=2
150 kHz~30MHz *U*=3.3dB k=2

Radiated Emission
30MHz~1000MHz *U*=4.3dB k=2
1GHz~6GHz *U*=4.6 dB k=2
6GHz~40GHz *U*=5.1dB k=2

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

Description	:	Mobile Phone
Manufacturer	:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Model Number	:	CPH2477
Operate Frequency	:	U-NII 1(5180~5240 MHz) U-NII 2A (5260~5320 MHz) U-NII 2C (5500~5700 MHz) U-NII 3(5745~5825 MHz)
Antenna Designation	:	Fixed Internal Antenna 2.5dBi
Operating voltage	:	DC3.6V (Low)/DC3.87V (Nominal)/DC4.45V (Max)
Software Version	:	ColorOS V12.1
Hardware Version	:	11

Remark: 1. There are two adapters, only the worst data of OP52YAUH (1#) shown in this report.
2. There are three batteries, only the worst data of BLP915 (1#) shown in this report.
3. This test report is for application of FCC ID: R9C-22263, which consists of reused data of FCC ID: R9C-CPH2477.See the APPENDIX I Product Equality Declaration for the differences between the new model CPH2477 and the original model CPH2477.
Considering above changes, all test data were reused in the original report No.: WT228001830.

Test Item	Condition	FCC ID	Report Number	Remark
6dB Bandwidth	Data reference	R9C-CPH2477	WT228001830	--
26dB Bandwidth				
Maximum Peak Conducted Power				
Maximum Power Spectral Density Level				
Radiated Bandedge and Spurious				
Conducted emission test for AC power port				

Frequency List:

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500	149	5745
40	5200	56	5280	104	5520	153	5765
44	5220	60	5300	108	5540	157	5785
48	5240	64	5320	112	5560	161	5805
				116	5580	165	5825
				120	5600		
				124	5620		
				128	5640		
				132	5660		
				136	5680		
				140	5700		

Table 2 802.11a/802.11n/802.11ac (20MHz) Frequency /Channel operations

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
46	5230	62	5310	110	5550	159	5795
				118	5590		
				126	5630		
				134	5670		

Table 3 802.11n/802.11ac (40MHz BW) Frequency /Channel operations

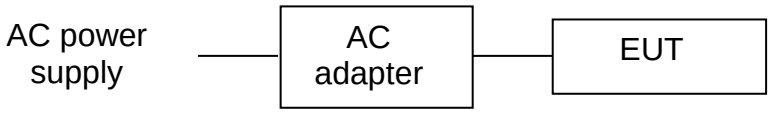
Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530	155	5775
				122	5610		

Table 4 802.11ac (80MHz) BW Frequency /Channel operations

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **R9C-22263** filing to comply with Section 15.207，15.209，15.407 of the FCC Part 15, Subpart E .

3.3. Block Diagram of EUT Configuration



Setup of test

3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in

semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).
Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.
Worst-case data rates as provided by the client were:
802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT20 mode: MCS0
802.11ac VHT40 mode: MCS0
802.11ac VHT80 mode: MCS0
802.11a operates in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.
802.11n operate in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.
802.11ac operate in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.

3.5. Directional Antenna Gain

The EUT does NOT support a WIFI MIMO function.
Directional gain need NOT to be considered.

3.6. Support Equipment List

Table 5 Support Equipment List

Name	Model No	S/N	Manufacturer
Adapter 1# for EUT	OP52YAUH	---	Jiangsu Chenyang Electron Co., Ltd.
Adapter 2# for EUT	OP52JAUH	---	Huizhou Golden Lake Industrial Co., Ltd.
Rechargeable Li-ion Polymer Battery 1# for EUT	BLP915	---	Chongqing CosMX Battery Co.,Ltd
Rechargeable Li-ion Polymer Battery 2# for EUT	BLP915	---	TWS Technology (Guangzhou) Limited
Rechargeable Li-ion Polymer Battery 3# for EUT	BLP915	---	Sunwoda Electronic CO.,LTD.
USB for EUT	DL122	---	---

3.7. Test Conditions

Date of test：Jul.25, 2022- Aug.16, 2022
Date of EUT Receive：Jul.20, 2022
Temperature: 23℃-25℃
Relative Humidity: 46%-58%

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 6 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB9058/05	Test Receiver	R&S	ESCI 3	Sep.24,2021	1 Year
SB4357	AMN	R&S	ENN216	Aug.25,2021	1 Year
SB9549	Shielded Room	Albatross	SR	Sep.24,2021	1 Year
SB17366	Test Receiver	R&S	ESR26	Jun.24,2022	1 Year
SB3955	Broadband Antenna	Schwarzbeck	VULB9163	Dec.30,2021	1 Year
SB9555/01	Semi Anechoic Chamber	Albatross	9×6×6(m)	Aug.25,2021	1 Year
SB13956	Test Receiver	R&S	ESR26	Feb.07,2022	1 Year
SB13961	Horn Antenna	R&S	HF907	Mar.22,2022	1 Year
SB8501/09	Test Receiver	R&S	ESU40	Jan.20,2022	1 Year
SB3435	Horn Antenna	R&S	HF906	Dec.03,2021	1 Year
SB9058/03	Pre-Amplifier	R&S	SCU 18	Jan.20,2022	1 Year
SB8501/10	Horn Antenna	R&S	3160-09	Mar.10,2020	3 Years
SB8501/11	Horn Antenna	R&S	3160-09	Mar.09,2020	3 Years
SB8501/12	Horn Antenna	R&S	3160-10	Mar.17,2020	3 Years
SB8501/13	Horn Antenna	R&S	3160-10	Mar.10,2020	3 Years
SB8501/14	Pre-Amplifier	R&S	SCU-03	Jan.20,2022	1 Year
SB8501/15	Pre-Amplifier	R&S	SCU-03	Jan.20,2022	1 Year
SB8501/16	Pre-Amplifier	R&S	SCU 26	Jan.20,2022	1 Year
SB8501/17	Pre-Amplifier	R&S	SCU-18	Jan.18,2022	1 Year
SB9059	Pre-Amplifier	R&S	SCU-40	Aug.10,2022	1 Year
SB9555/02	Fully Anechoic Chamber	Albatross	10.0×5.2×5.4(m)	Aug.25,2021	1 Year
SB20321/01	Spectrum Analyzer	R&S	FSV3044	Dec.24, 2021	1 Year

Table 7 Test software

Name	Manufacturer	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co.,ltd	2.6.87.0615

5. DUTY CYCLE

5.1. Limits of Duty Cycle

None; for reporting purposes only

5.2. Test Procedure

1. Set span = Zero
2. RBW = 20MHz
3. VBW = 30MHz,
4. Detector = Peak

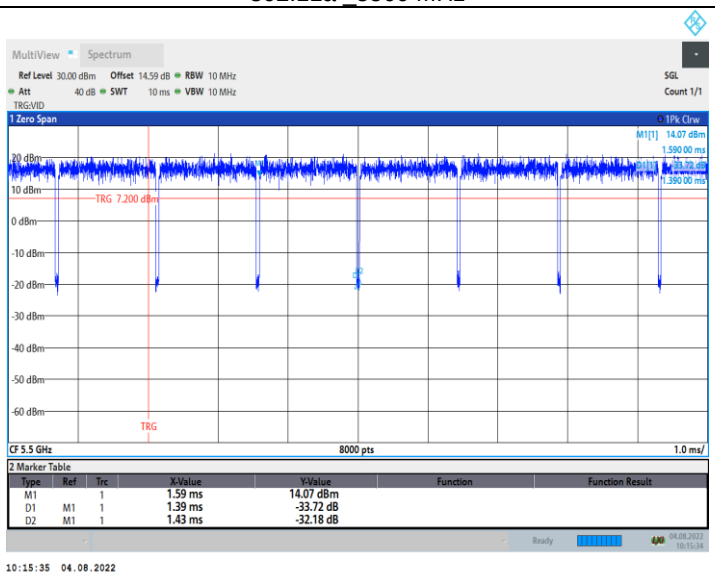
5.3. Test Setup

5.4. Test Data

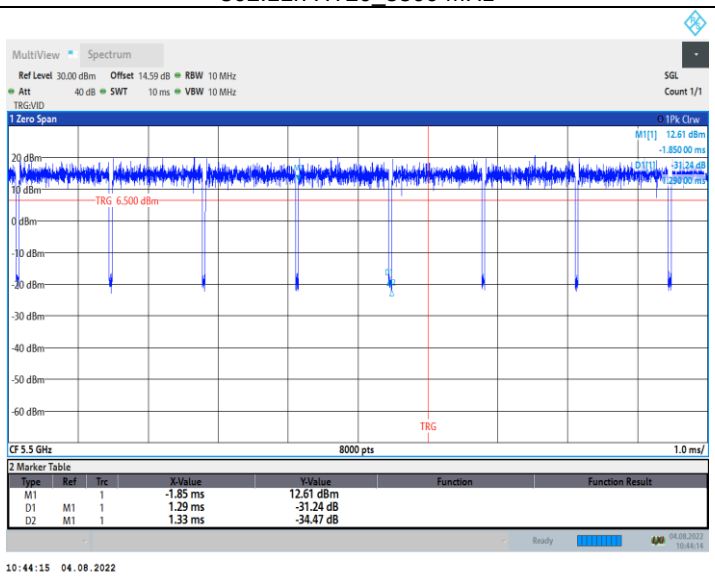
Table 8 Duty Cycle Test Data

Test Mode	On Time (ms)	Duty Cycle (%)	Duty Factor	1/T Minimum VBW (kHz)
802.11a	1.39	97.20	0.12	0.01
802.11n HT20	1.29	96.99	0.13	0.01
802.11n HT40	0.63	92.65	0.33	0.01
802.11ac VHT20	1.31	97.04	0.13	0.01
802.11ac VHT40	0.65	92.86	0.32	0.01
802.11ac VHT80	0.32	86.49	0.63	0.01

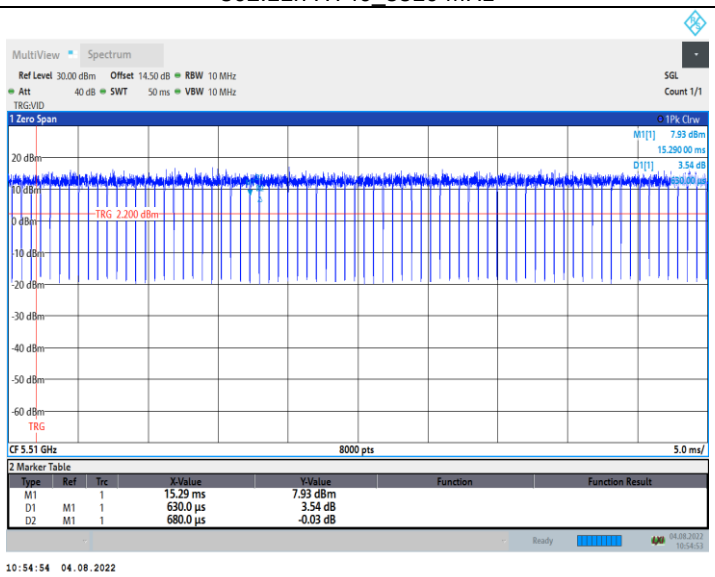
802.11a _5500 MHz



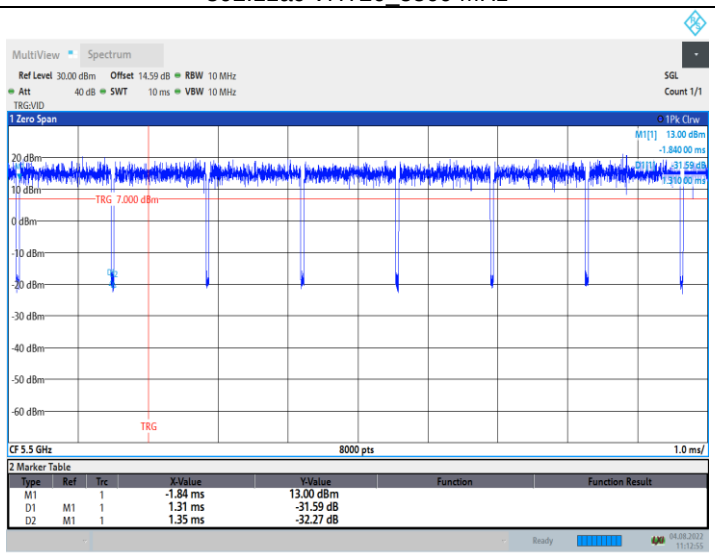
802.11n HT20_5500 MHz



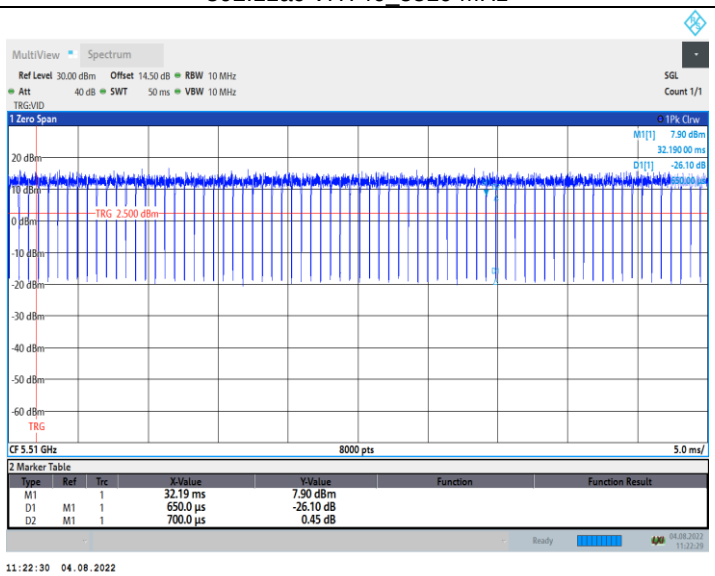
802.11n HT40_5510 MHz



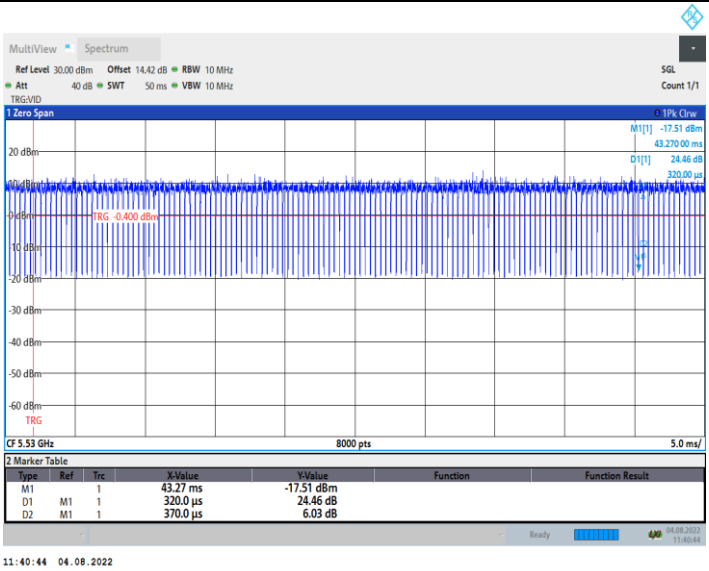
802.11ac VHT20_5500 MHz



802.11ac VHT40_5510 MHz



802.11ac VHT80_5530 MHz



6. 6DB BANDWIDTH MEASUREMENT

6.1. Limits of 6dB Bandwidth Measurement

The minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725-5.85 GHz.

6.2. Test Procedure

The transmitter output was connected to the spectrum analyzer.
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 x RBW.
c)Detector = Peak.
d)Trace mode = max hold.
e)Sweep = auto couple.
f)Allow the trace to stabilize.
g)Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3. Test Setup

6.4. Test Data

Table 9 6dB Bandwidth Test Data

Test Mode	Test Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
802.11a	5745	15.12	0.5	PASS
802.11a	5785	15.12	0.5	PASS
802.11a	5825	15.12	0.5	PASS
802.11n HT20	5745	15.12	0.5	PASS
802.11n HT20	5785	15.16	0.5	PASS
802.11n HT20	5825	15.12	0.5	PASS
802.11n HT40	5755	35.12	0.5	PASS
802.11n HT40	5795	35.12	0.5	PASS
802.11ac VHT20	5745	15.12	0.5	PASS
802.11ac VHT20	5785	15.12	0.5	PASS
802.11ac VHT20	5825	15.12	0.5	PASS

802.11ac VHT40	5755	35.20	0.5	PASS
802.11ac VHT40	5795	35.20	0.5	PASS
802.11ac VHT80	5775	75.20	0.5	PASS

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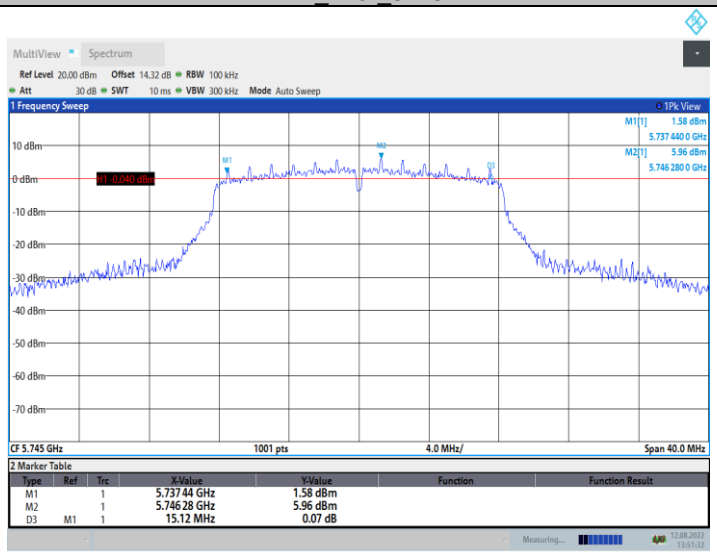

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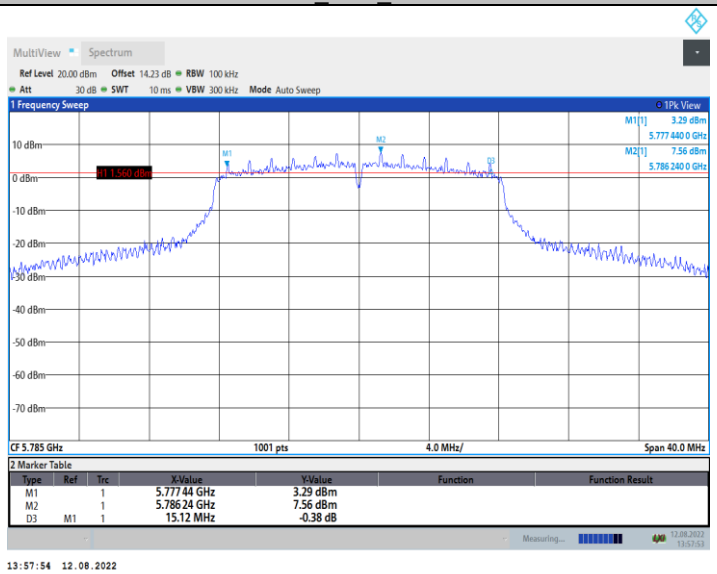

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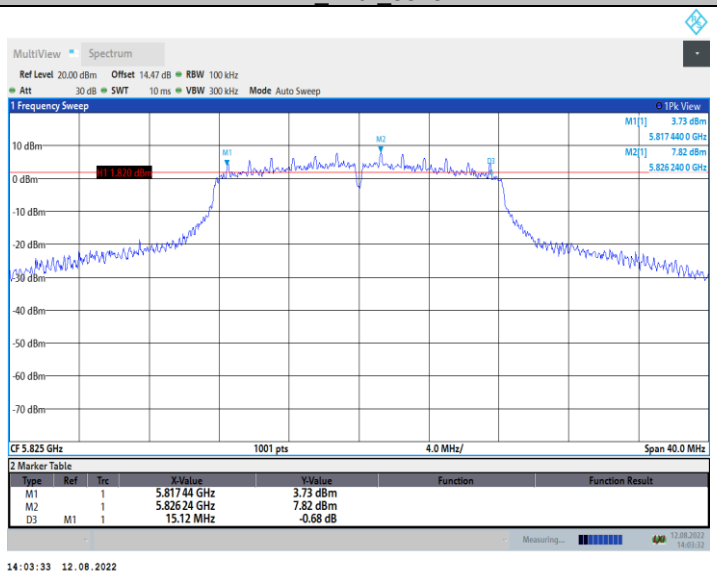

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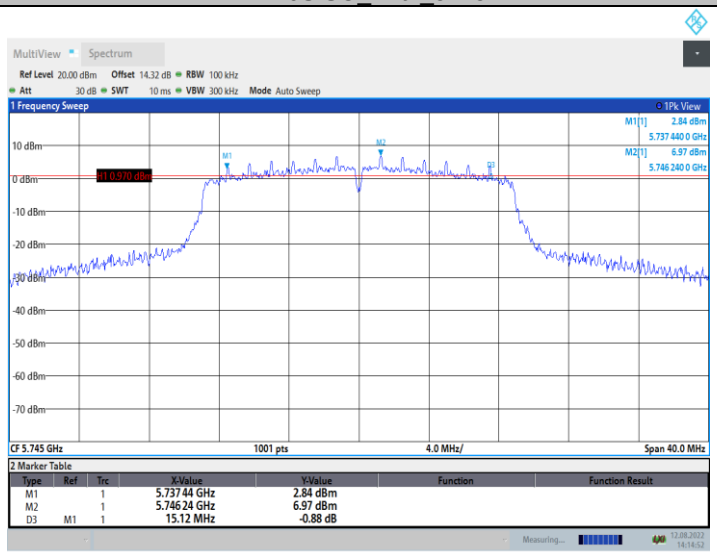

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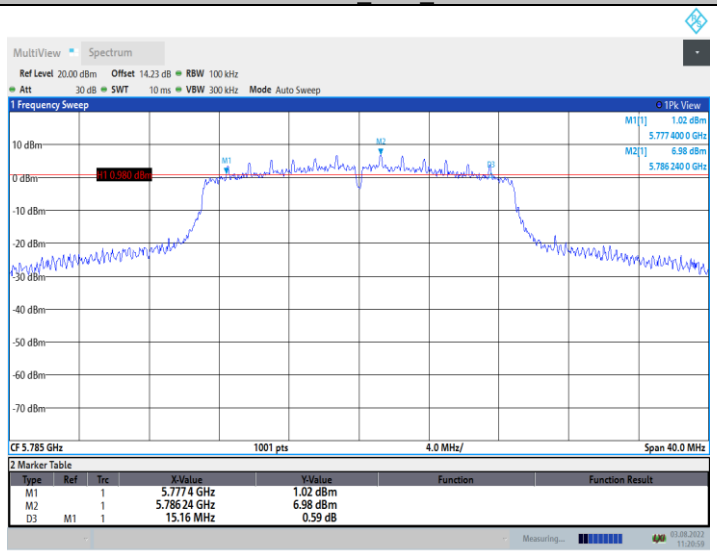

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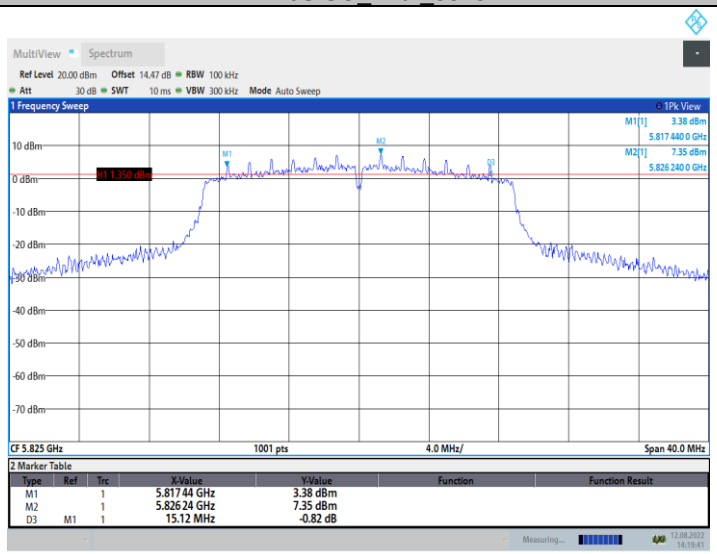

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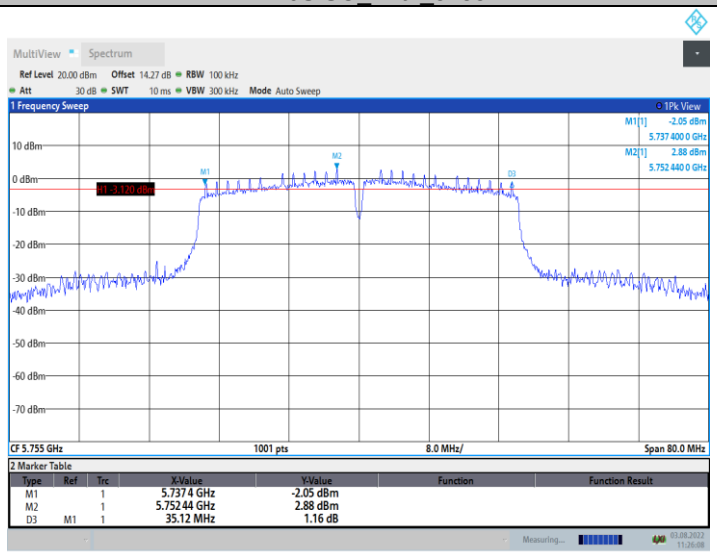

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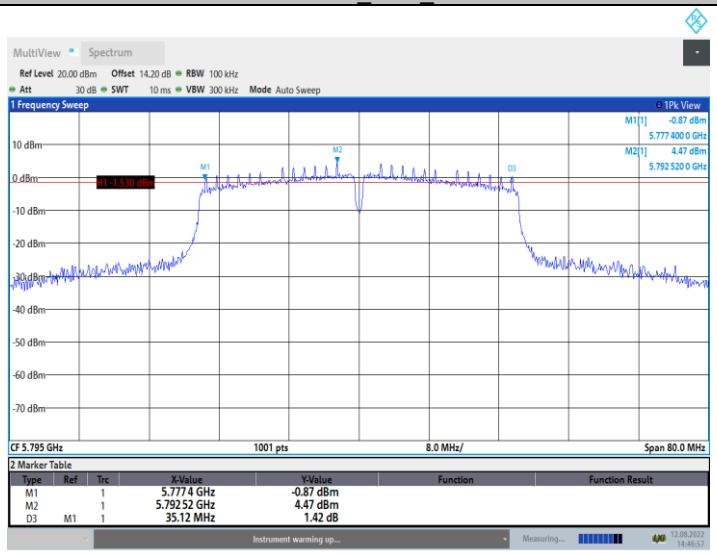

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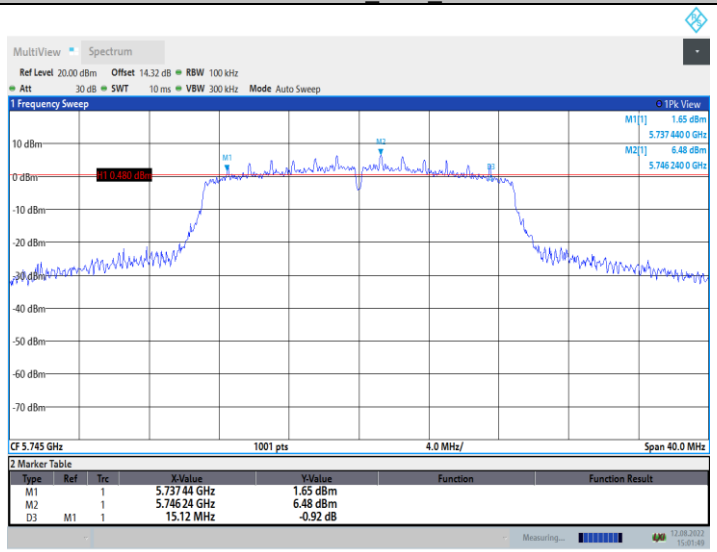

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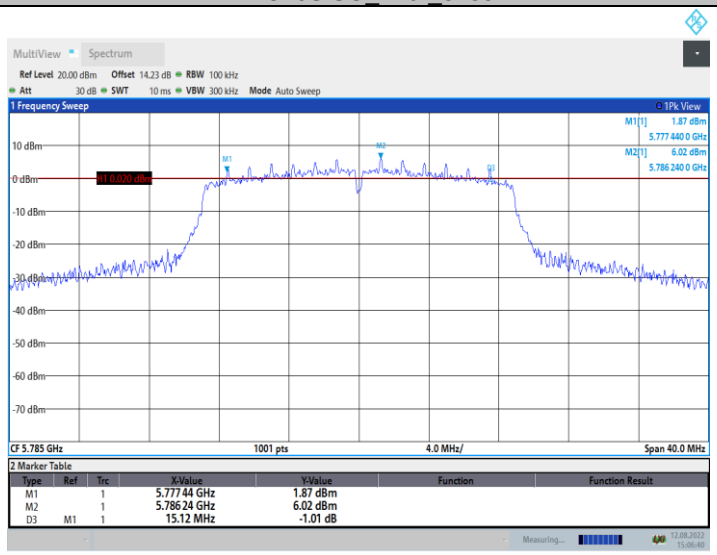

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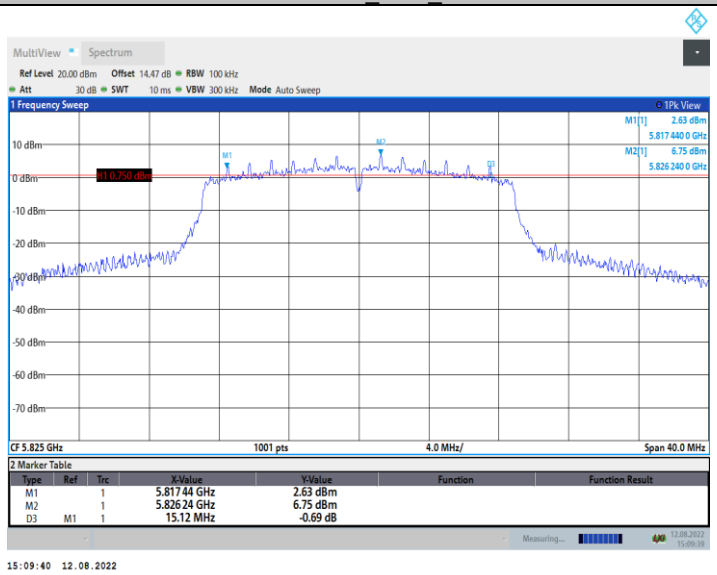

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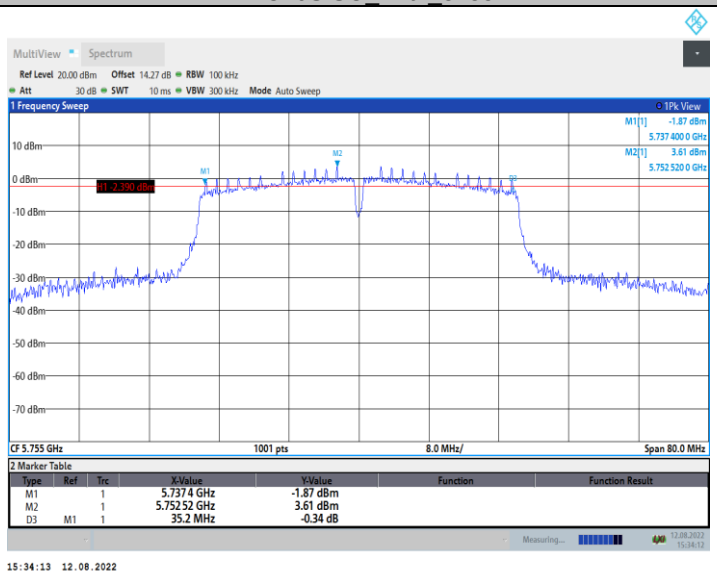

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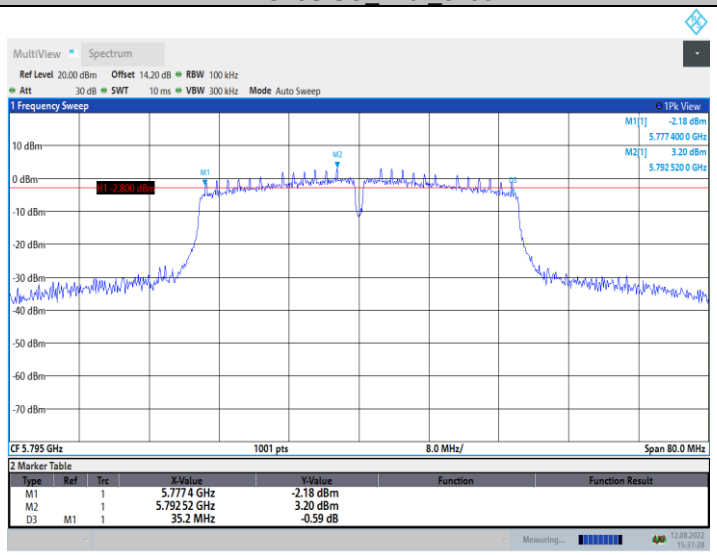

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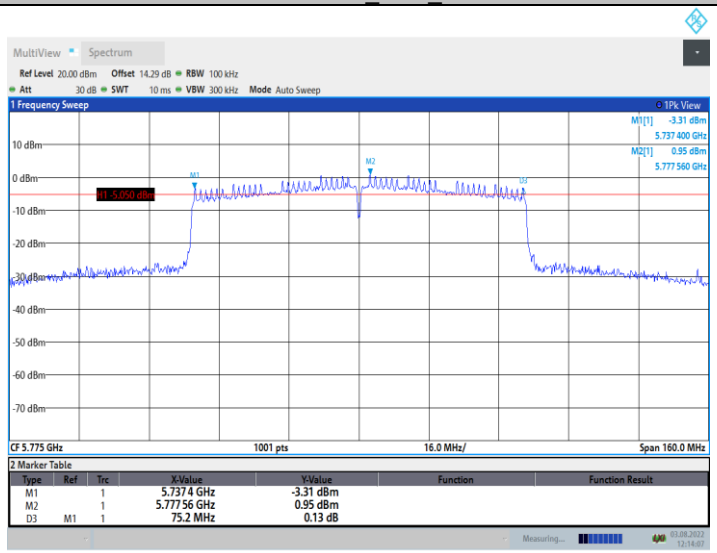

12:14:08 03.08.2022

7. 26DB BANDWIDTH MEASUREMENT

7.1. Limts of 26dB Bandwidth Measurement

None; for reporting purposes only.

7.2. Test Setup

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

7.3. Test Setup

7.4. Test Data

Table 10 26dB Bandwidth Test Data

Test Mode	Test Channel	26dB Bandwidth [MHz]	Limit[MHz]	Verdict
802.11a	5180	20.40	---	PASS
802.11a	5200	19.80	---	PASS
802.11a	5240	19.76	---	PASS
802.11a	5260	19.92	---	PASS
802.11a	5280	19.88	---	PASS
802.11a	5320	19.96	---	PASS
802.11a	5500	19.92	---	PASS
802.11a	5600	21.08	---	PASS
802.11a	5700	19.92	---	PASS
802.11a	5745	20.68	---	PASS
802.11a	5785	27.20	---	PASS
802.11a	5825	25.72	---	PASS
802.11n HT20	5180	20.40	---	PASS
802.11n HT20	5200	29.04	---	PASS
802.11n HT20	5240	20.12	---	PASS

802.11n HT20	5260	22.48	---	PASS
802.11n HT20	5280	20.36	---	PASS
802.11n HT20	5320	20.04	---	PASS
802.11n HT20	5500	20.36	---	PASS
802.11n HT20	5600	23.04	---	PASS
802.11n HT20	5700	20.24	---	PASS
802.11n HT20	5745	23.96	---	PASS
802.11n HT20	5785	28.24	---	PASS
802.11n HT20	5825	26.24	---	PASS
802.11n HT40	5190	41.04	---	PASS
802.11n HT40	5230	40.96	---	PASS
802.11n HT40	5270	41.44	---	PASS
802.11n HT40	5310	40.80	---	PASS
802.11n HT40	5510	40.80	---	PASS
802.11n HT40	5590	46.64	---	PASS
802.11n HT40	5670	40.80	---	PASS
802.11n HT40	5755	43.92	---	PASS
802.11n HT40	5795	61.04	---	PASS
802.11ac VHT20	5180	20.28	---	PASS
802.11ac VHT20	5200	26.12	---	PASS
802.11ac VHT20	5240	20.08	---	PASS
802.11ac VHT20	5260	20.24	---	PASS
802.11ac VHT20	5280	20.20	---	PASS
802.11ac VHT20	5320	20.44	---	PASS
802.11ac VHT20	5500	20.32	---	PASS
802.11ac VHT20	5600	23.72	---	PASS
802.11ac VHT20	5700	20.28	---	PASS
802.11ac VHT20	5745	23.68	---	PASS
802.11ac VHT20	5785	21.84	---	PASS
802.11ac VHT20	5825	22.92	---	PASS
802.11ac VHT40	5190	41.28	---	PASS
802.11ac VHT40	5230	65.52	---	PASS
802.11ac VHT40	5270	48.32	---	PASS
802.11ac VHT40	5310	41.12	---	PASS
802.11ac VHT40	5510	40.88	---	PASS
802.11ac VHT40	5590	41.52	---	PASS
802.11ac VHT40	5670	40.80	---	PASS
802.11ac VHT40	5755	51.68	---	PASS
802.11ac VHT40	5795	46.00	---	PASS
802.11ac VHT80	5210	81.60	---	PASS

802.11ac VHT80	5290	81.28	---	PASS
802.11ac VHT80	5530	81.76	---	PASS
802.11ac VHT80	5610	81.44	---	PASS
802.11ac VHT80	5775	156.64	---	PASS

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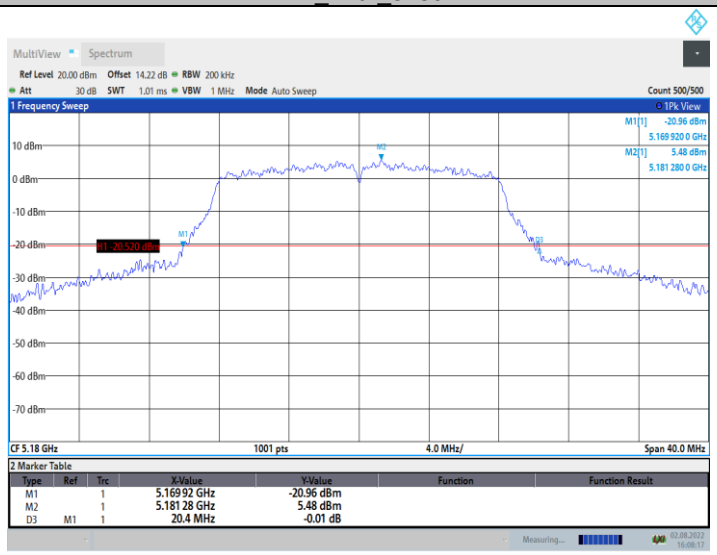

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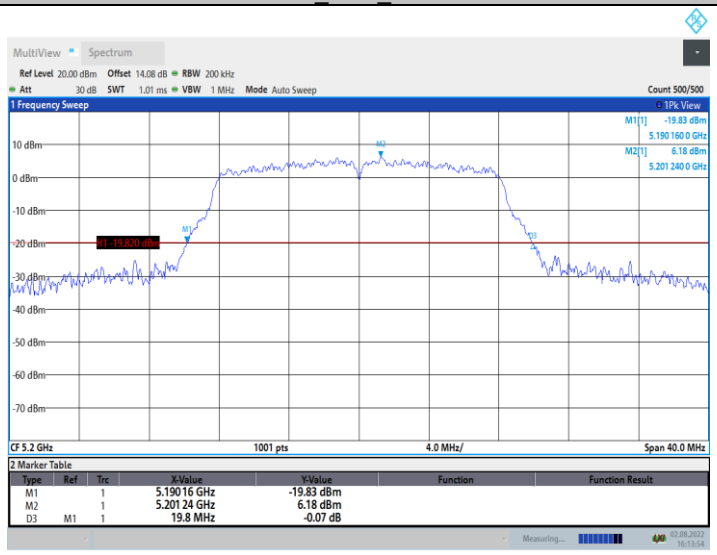

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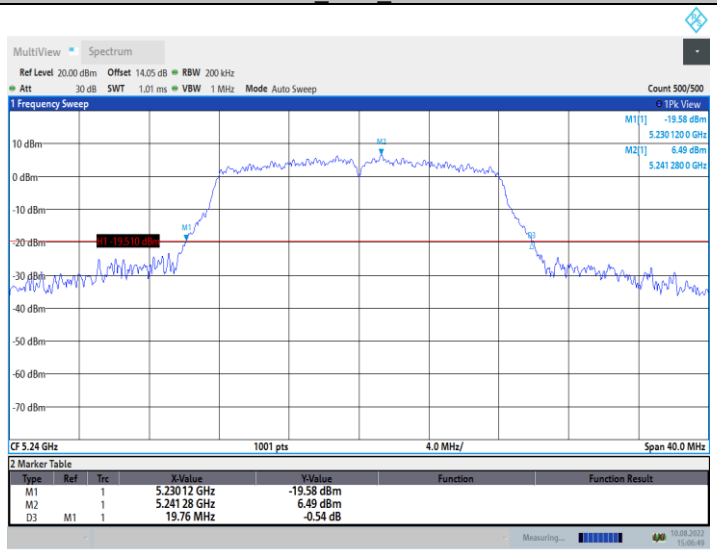

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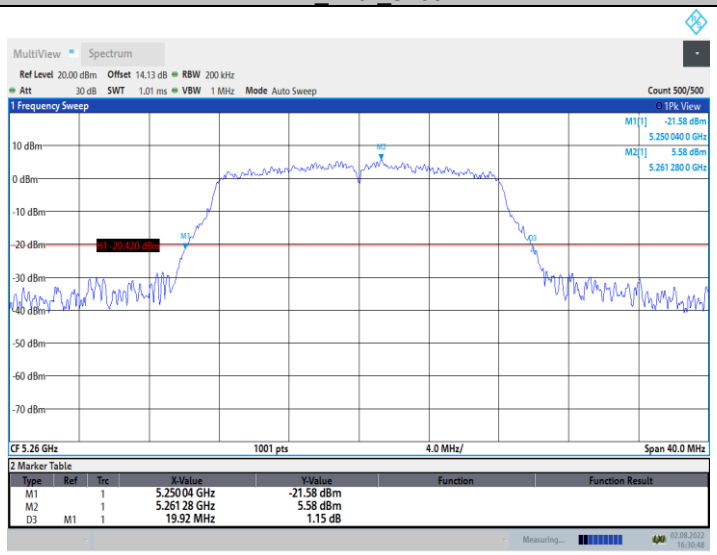

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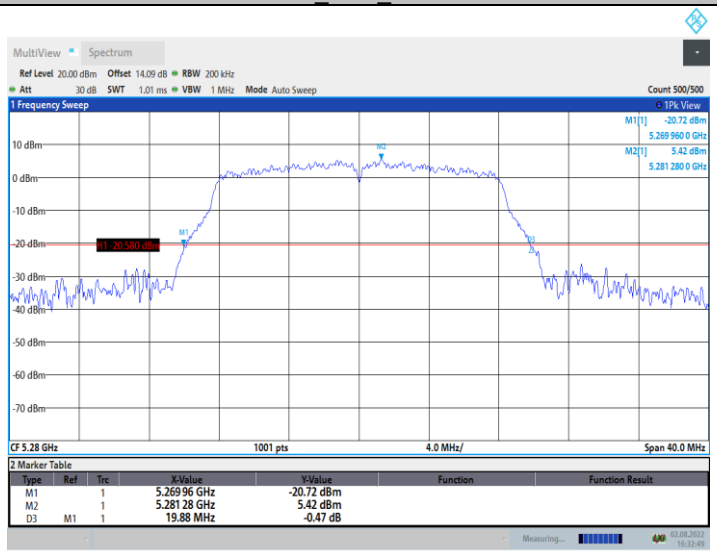

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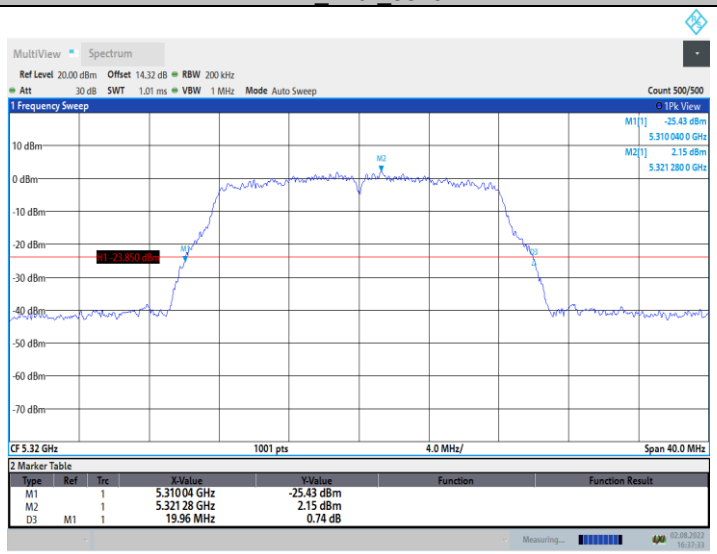

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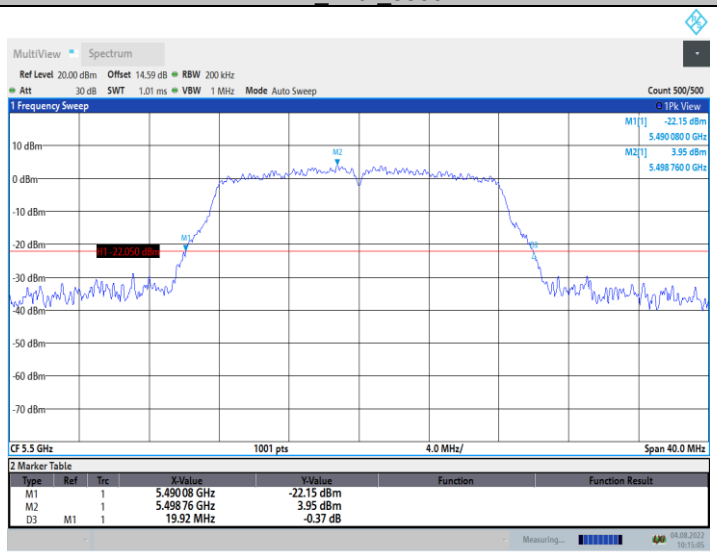

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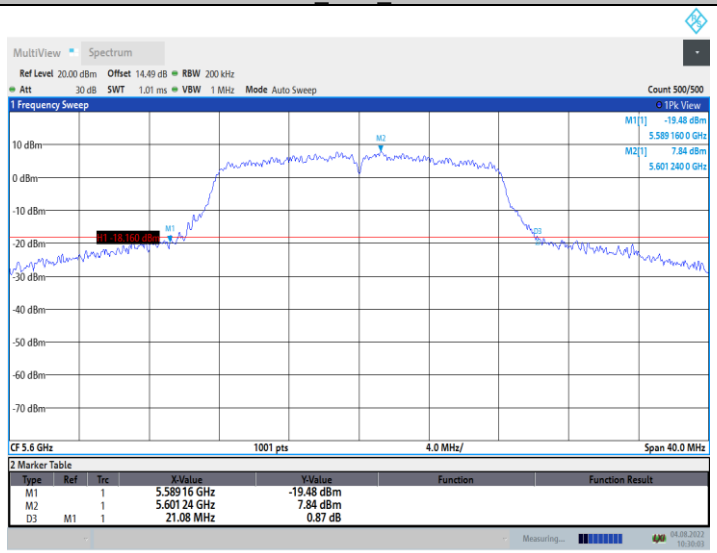

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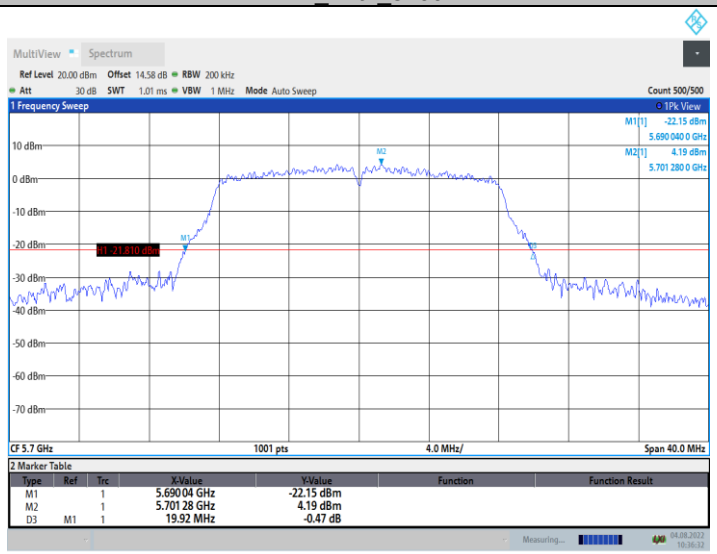

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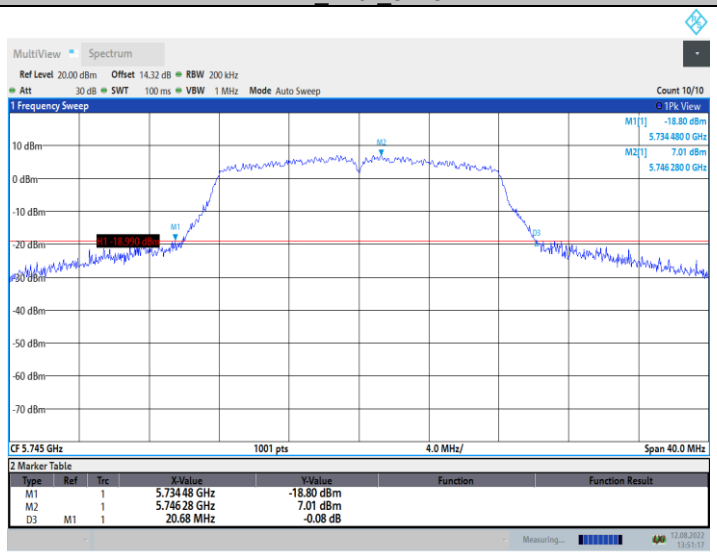

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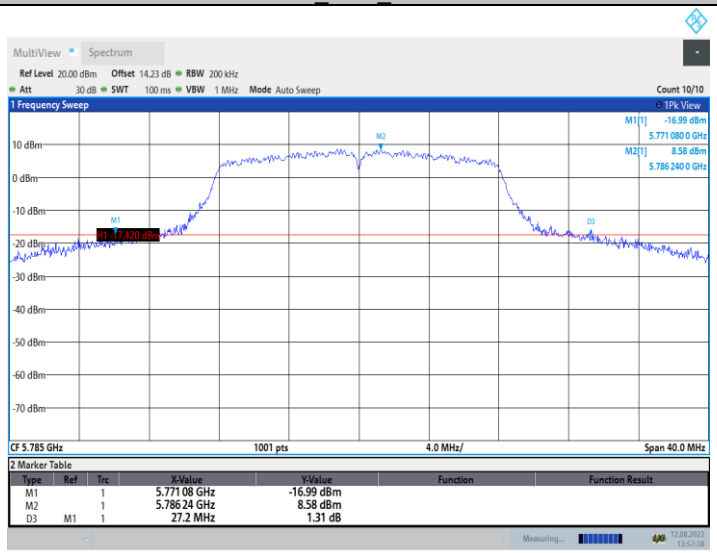

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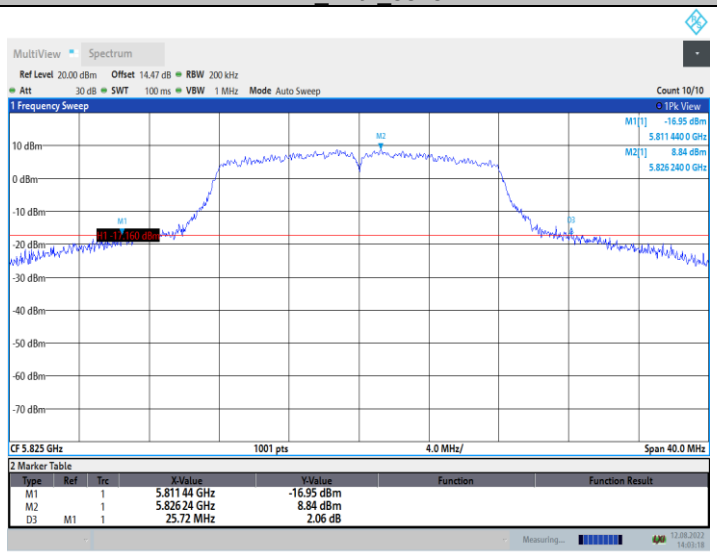

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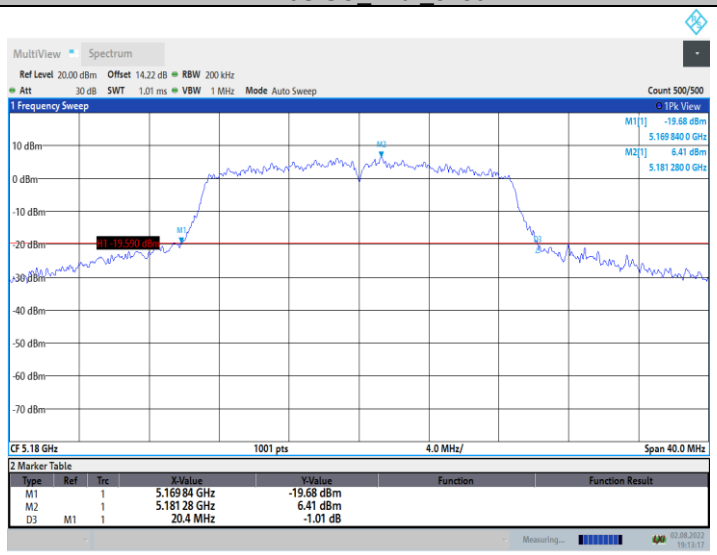

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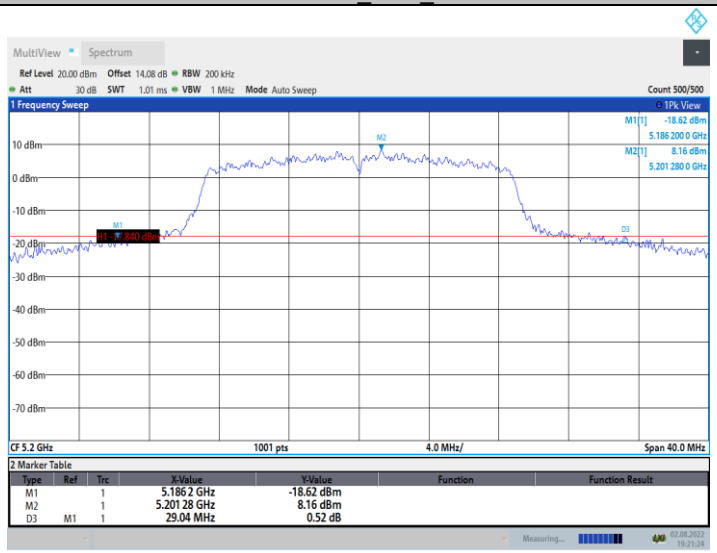

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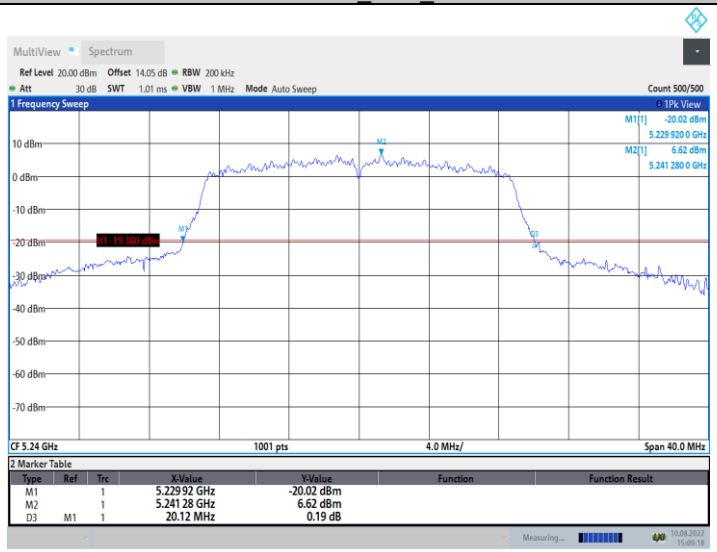

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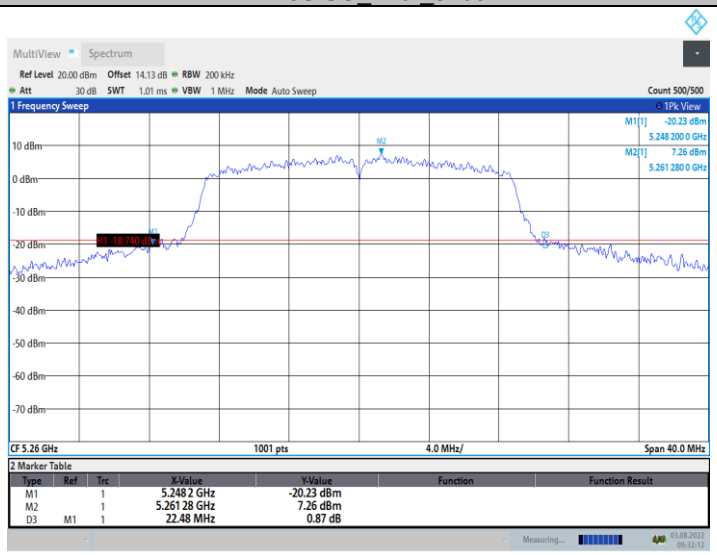

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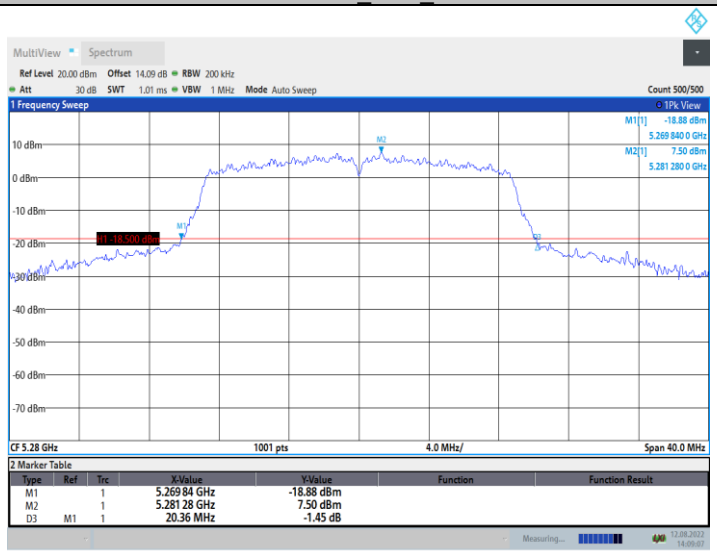

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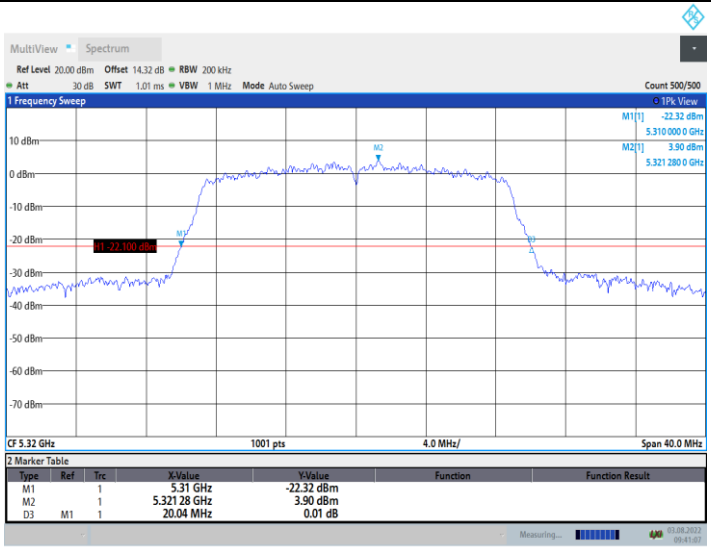

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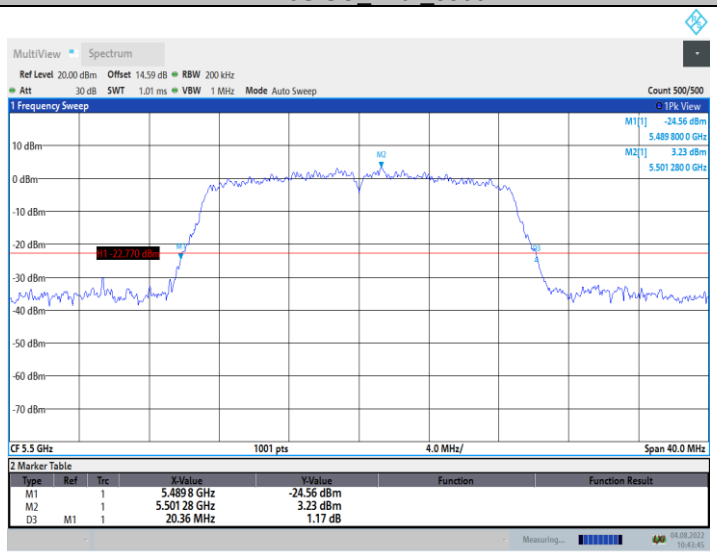

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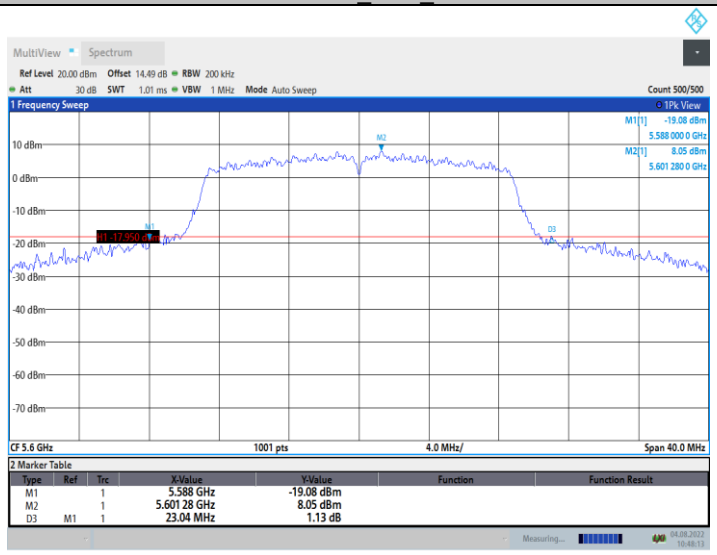

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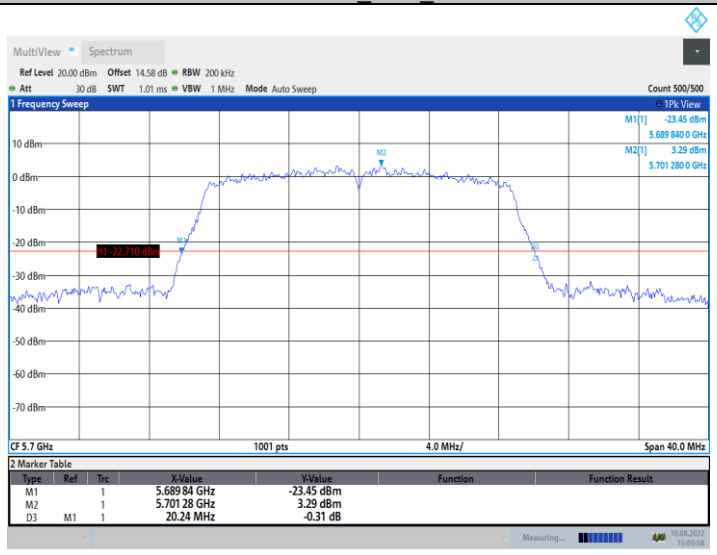

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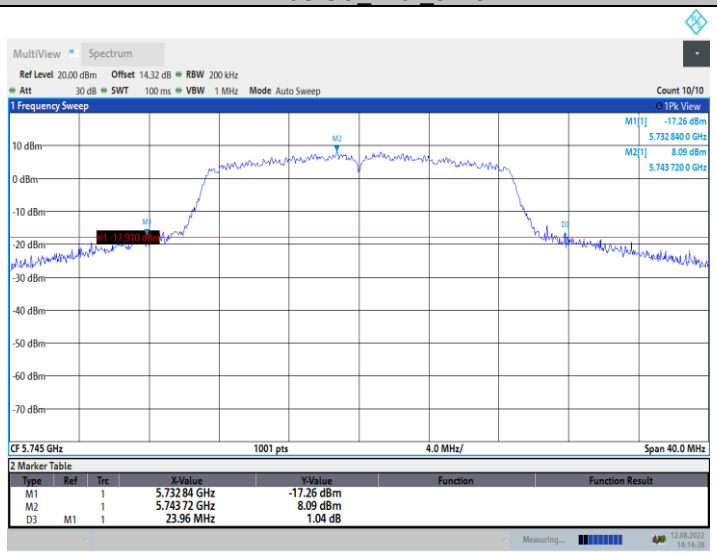

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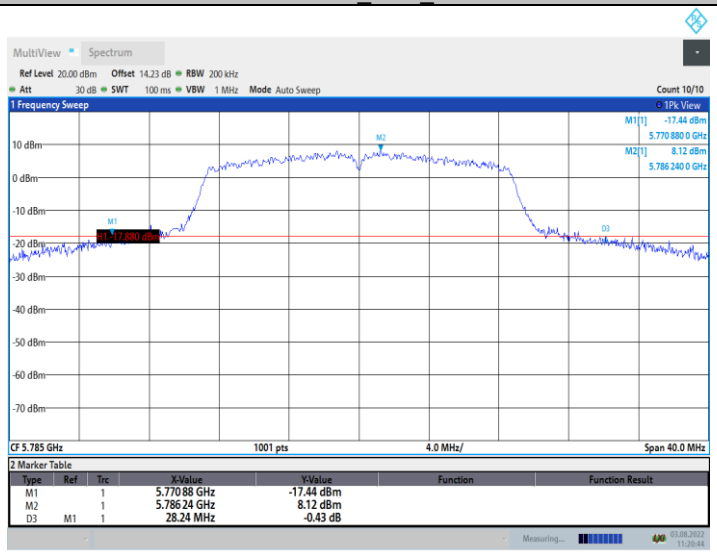

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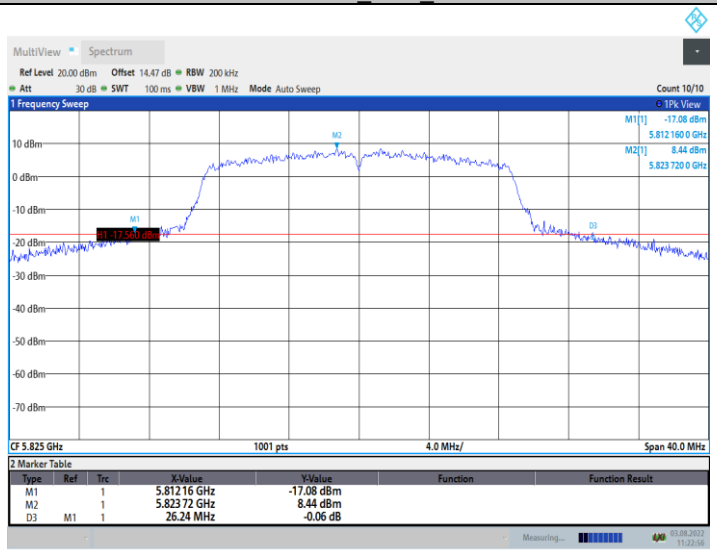

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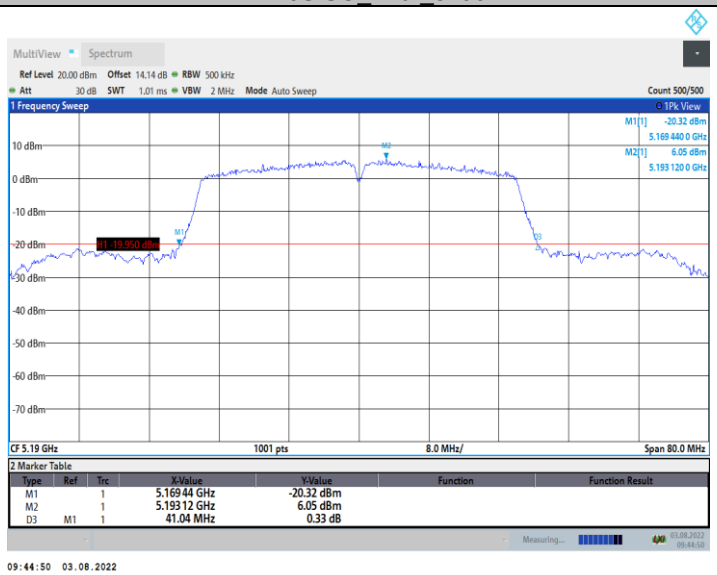

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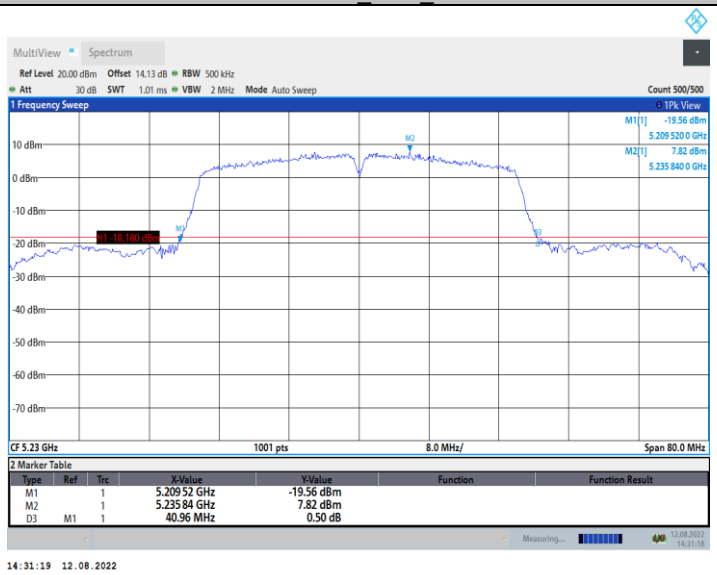

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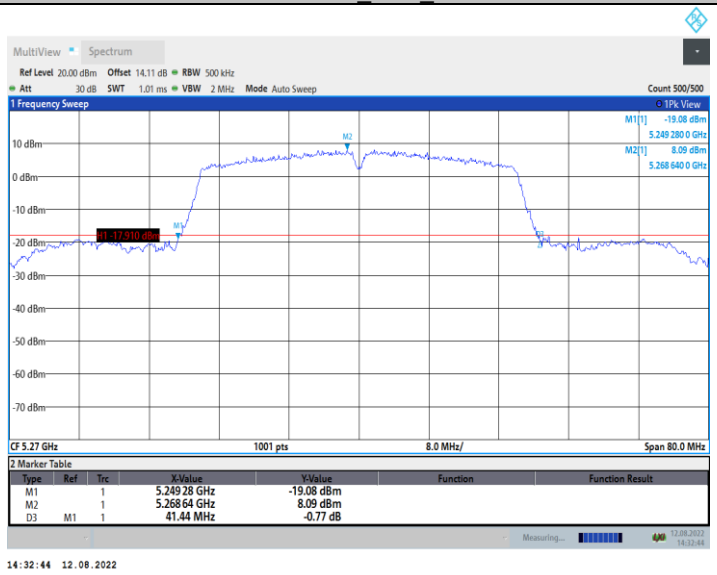

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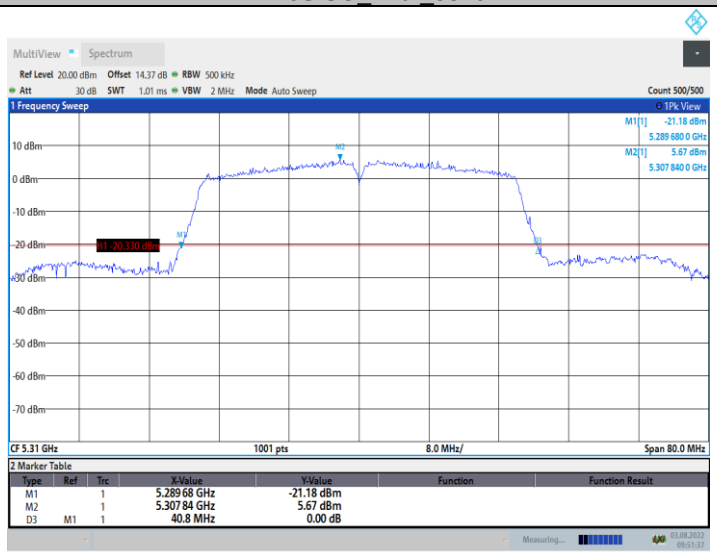

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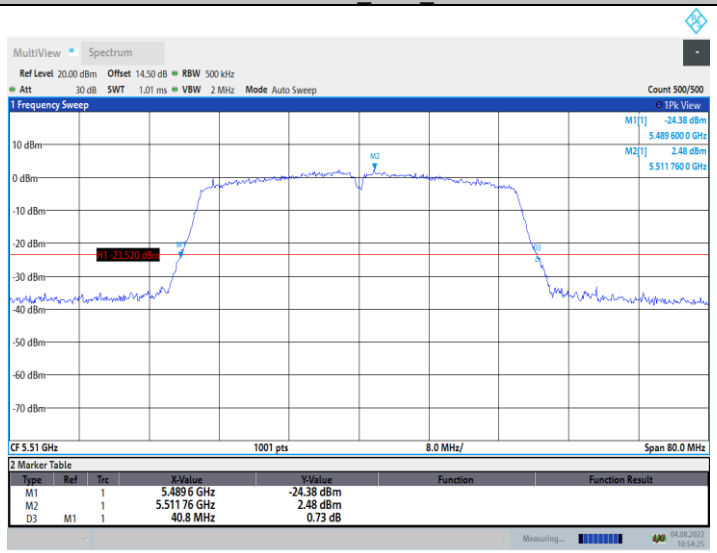

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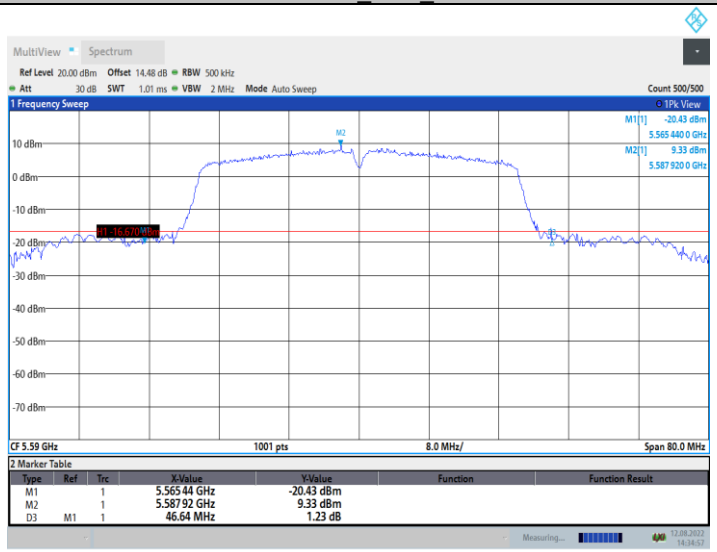

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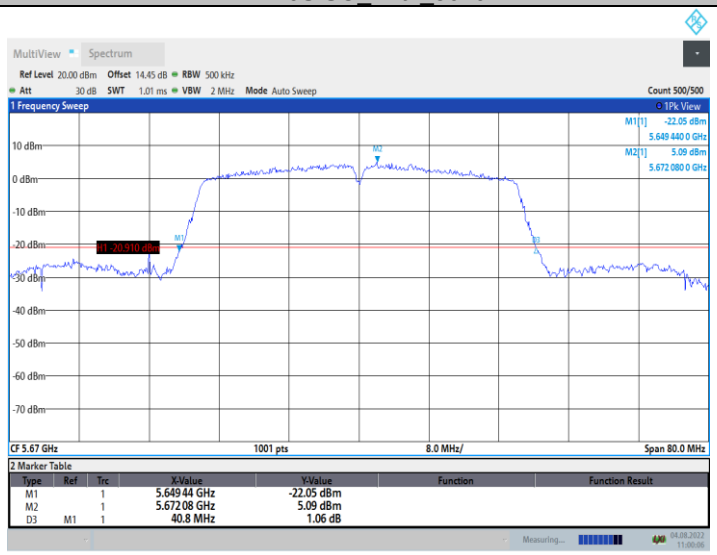

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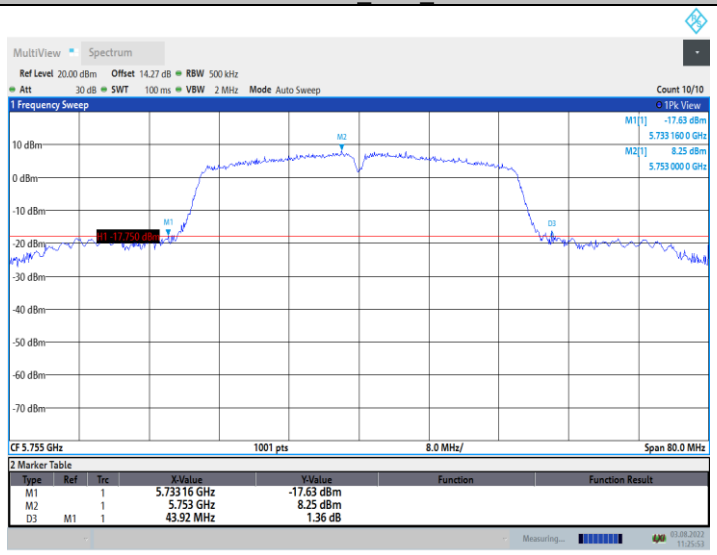

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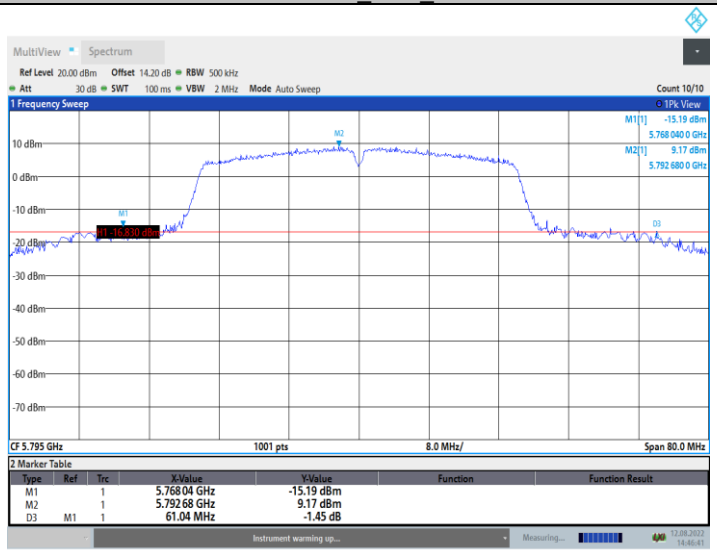

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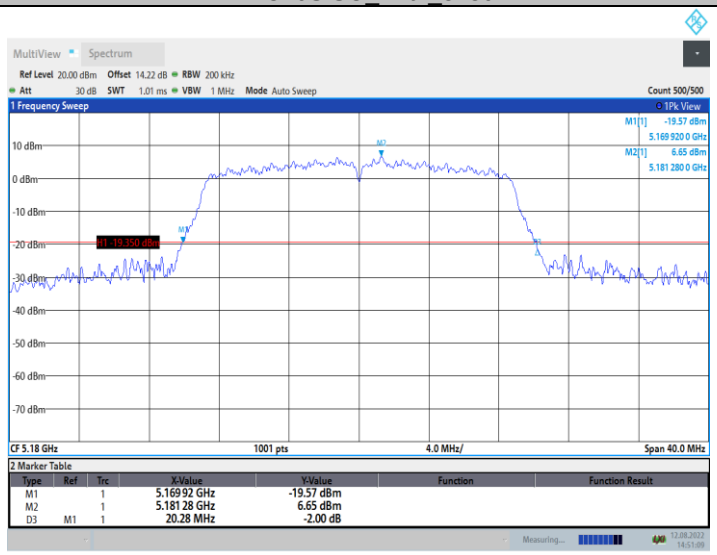

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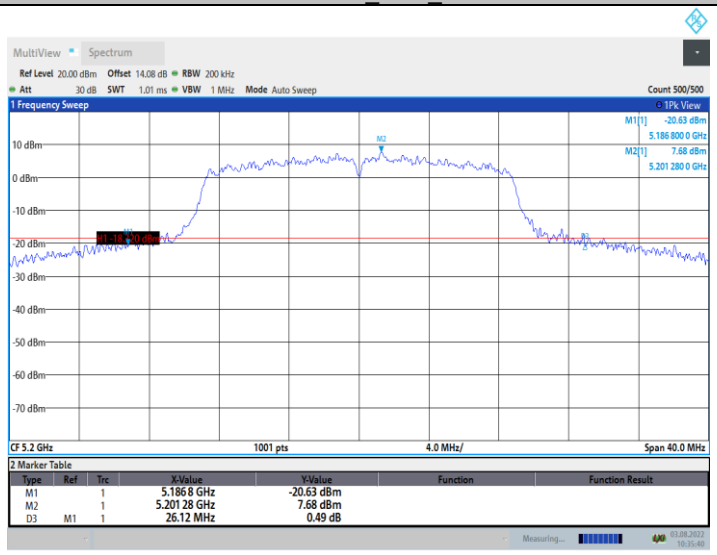

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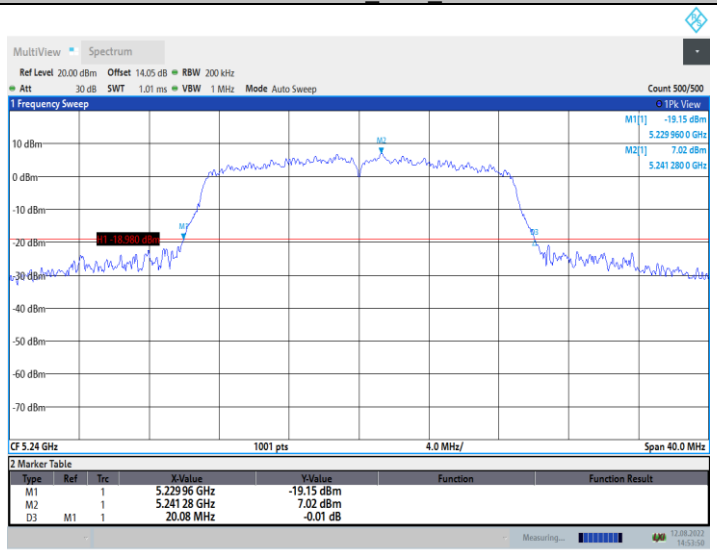

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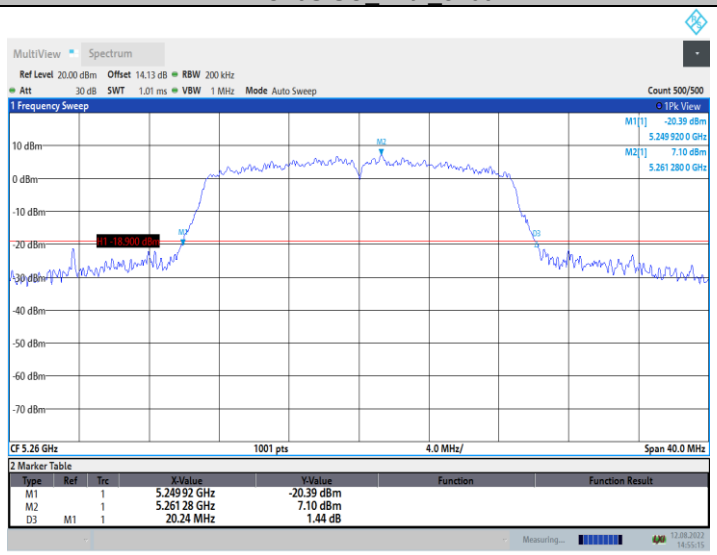

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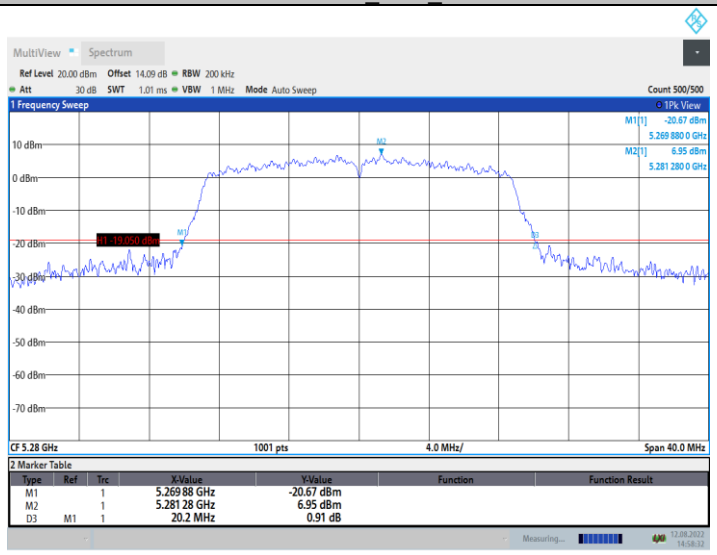

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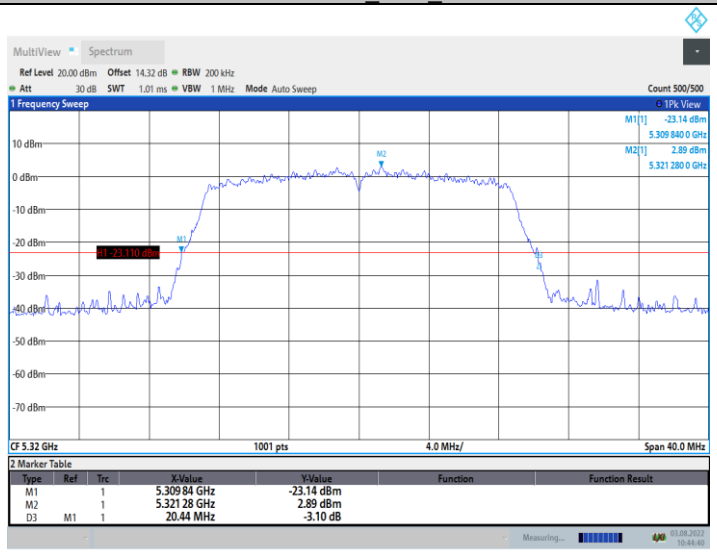

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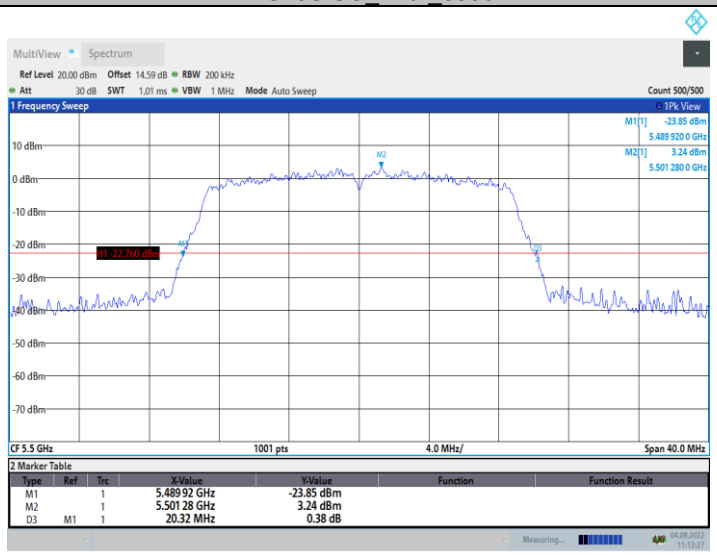

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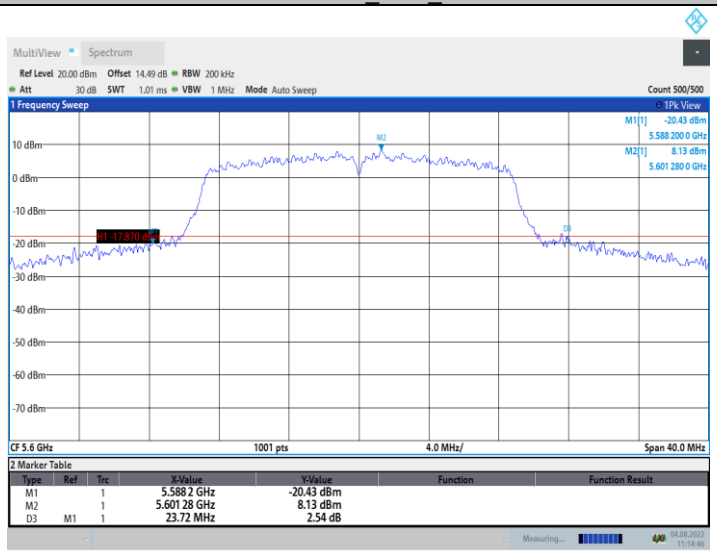

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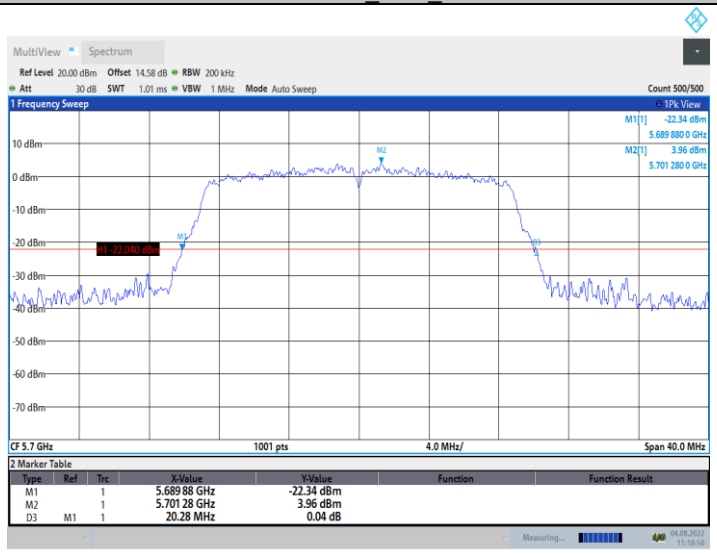

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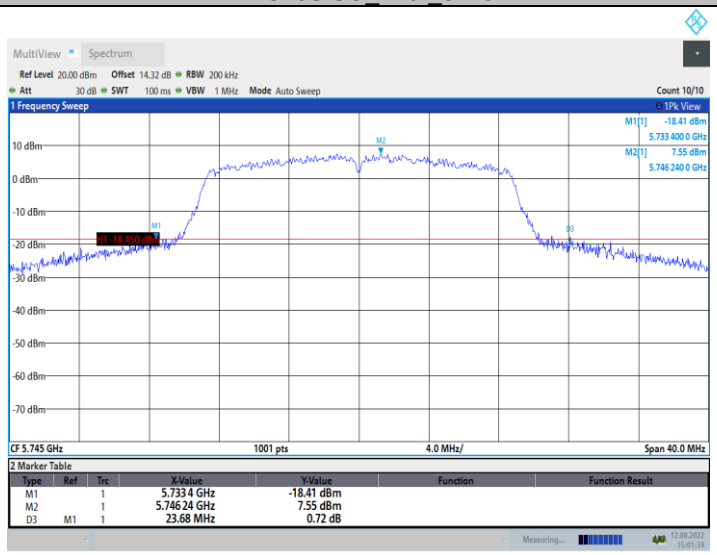

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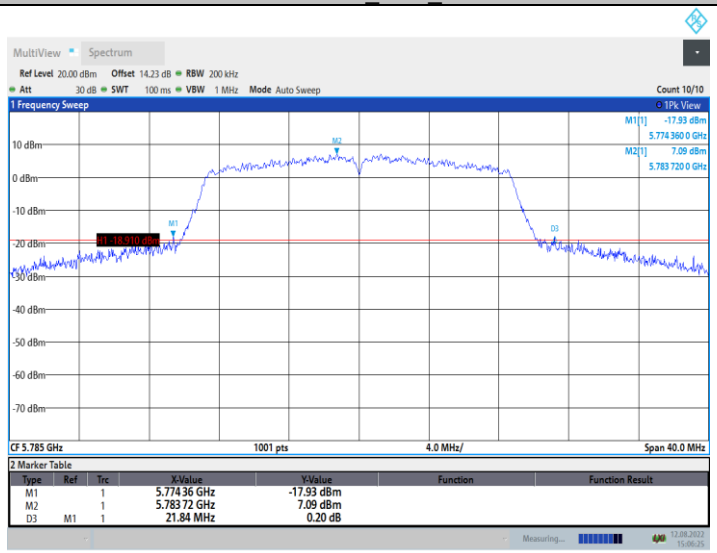

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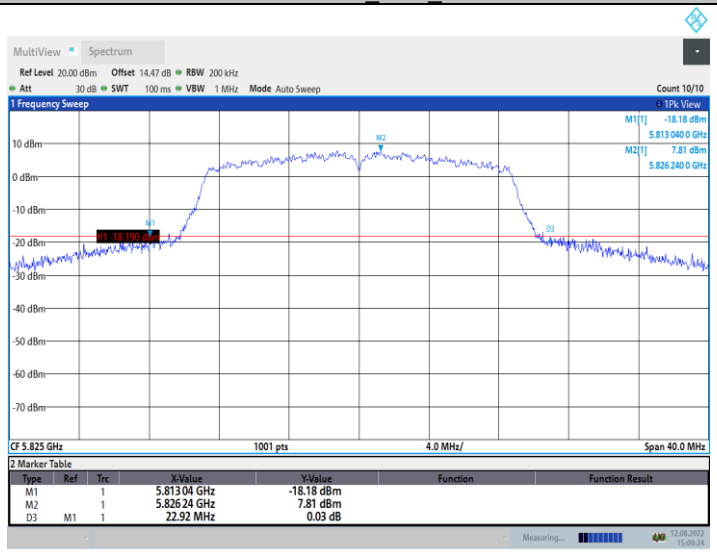

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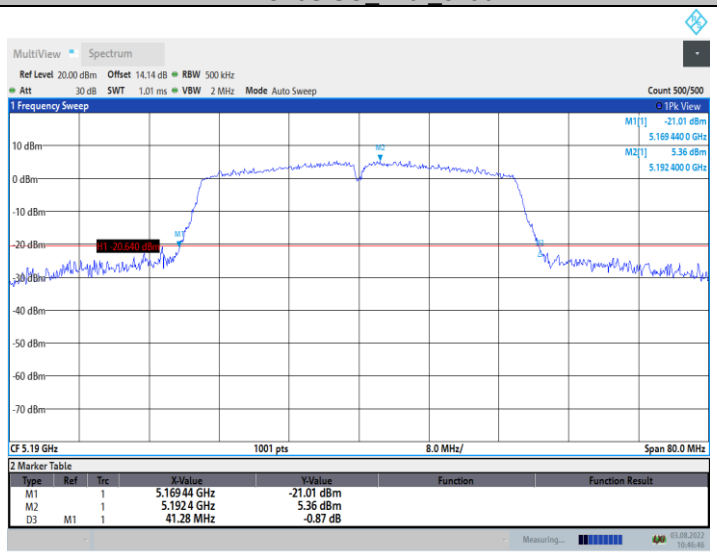

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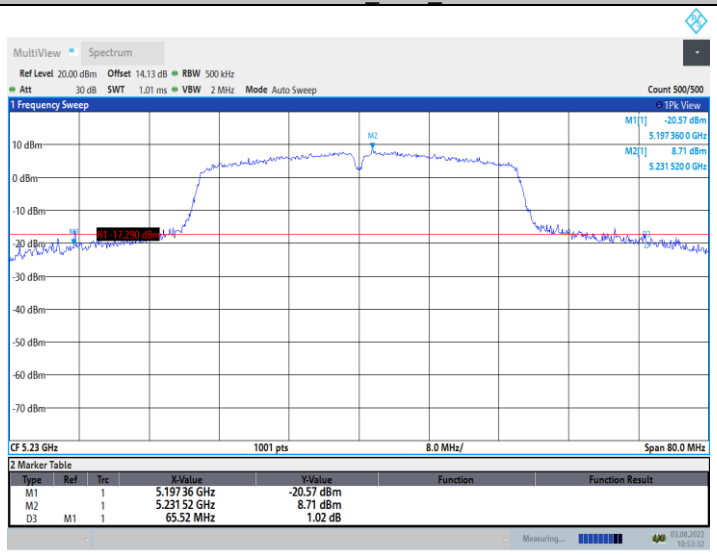

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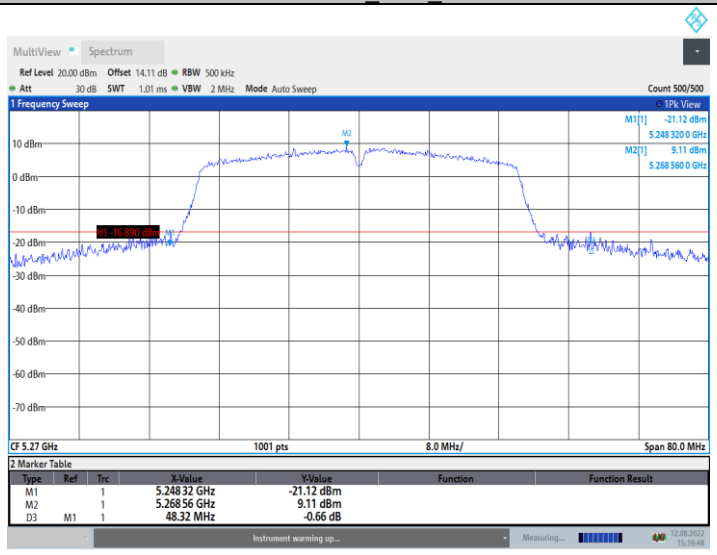

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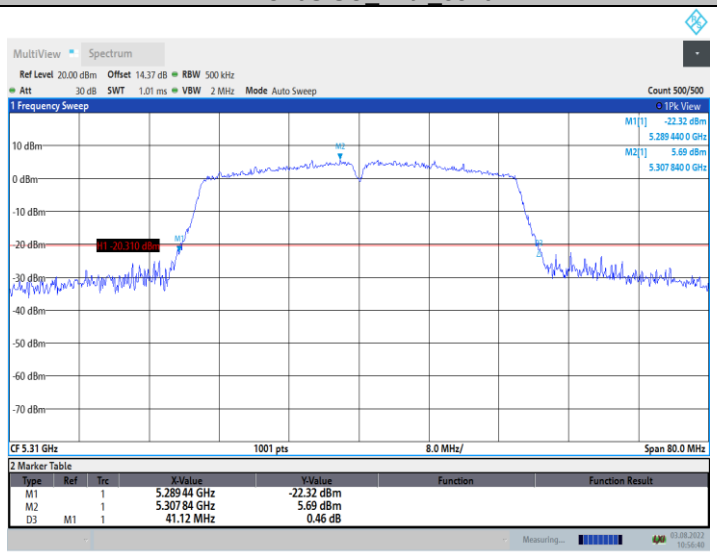

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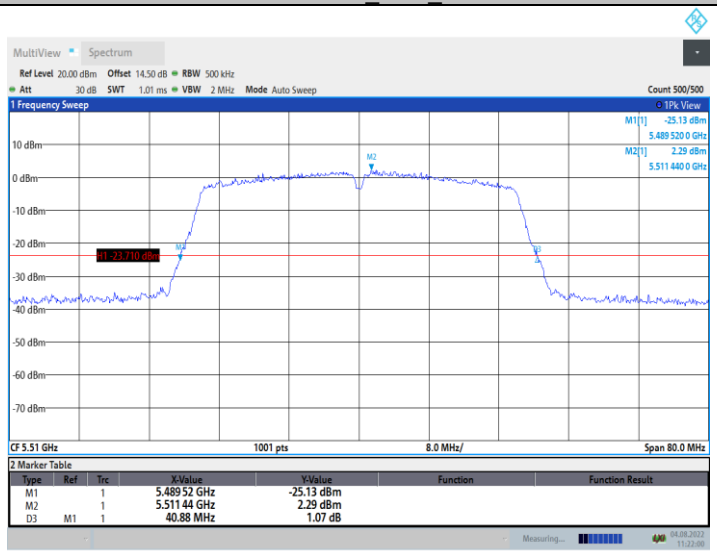

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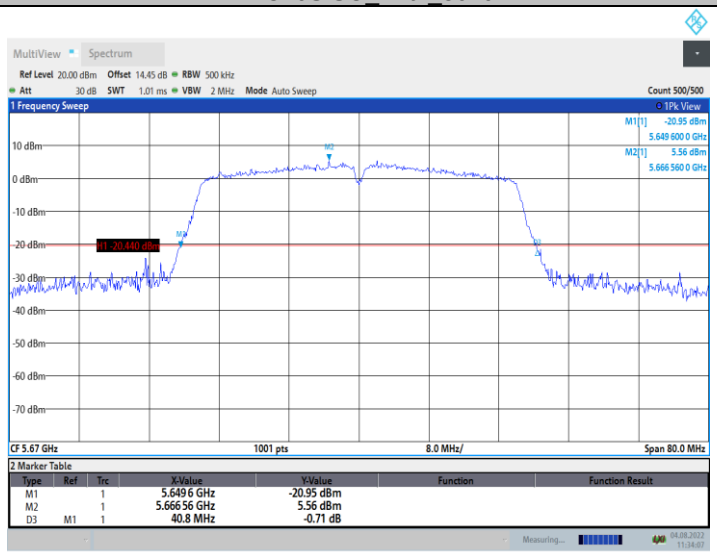

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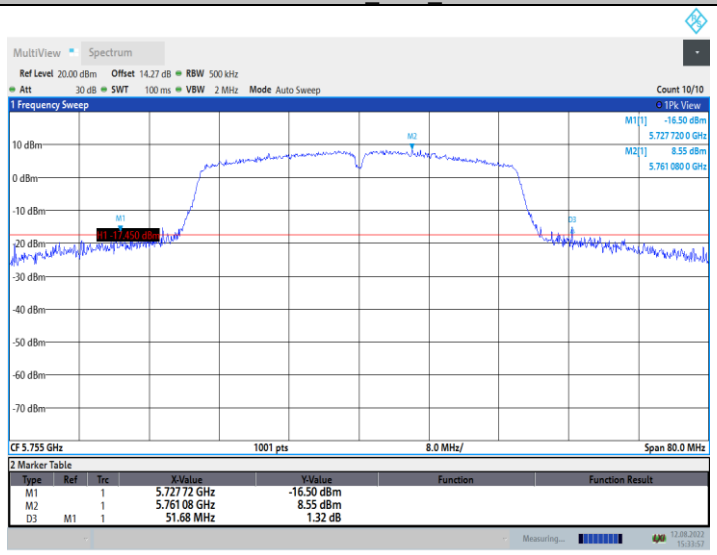

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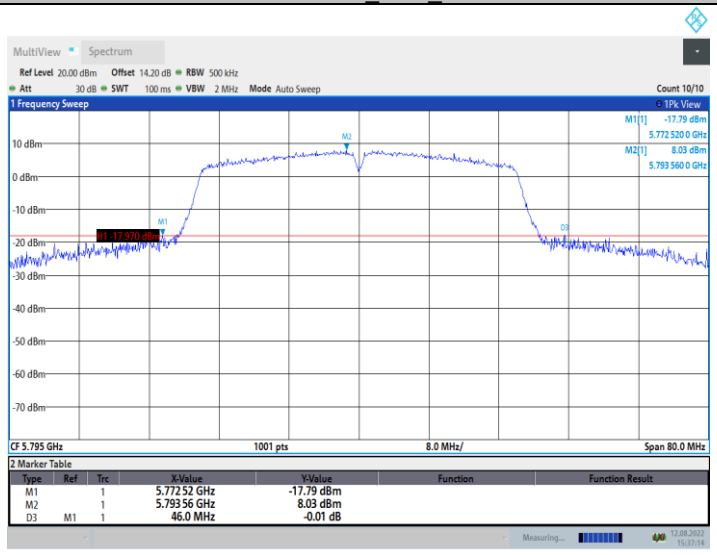

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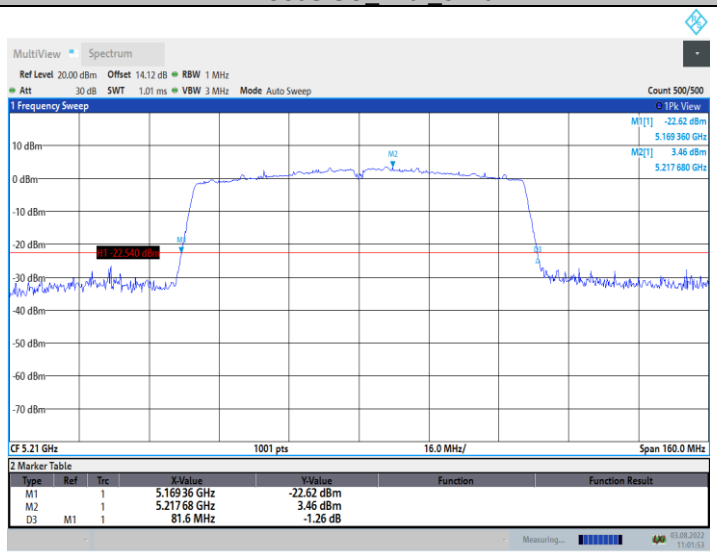

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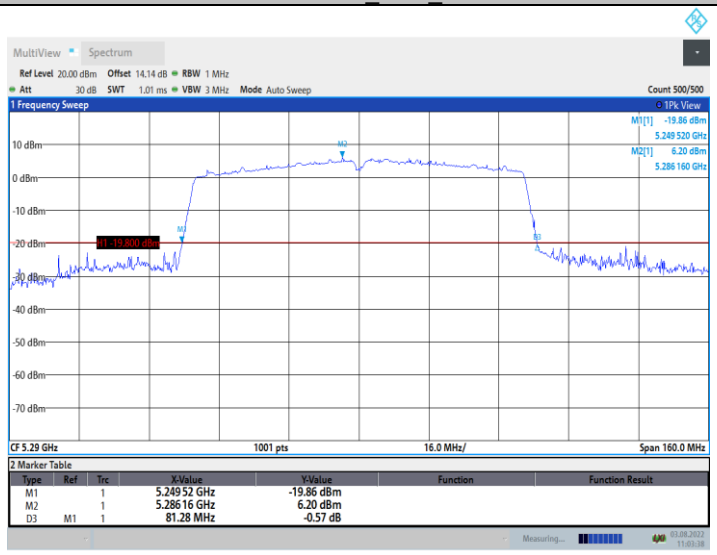

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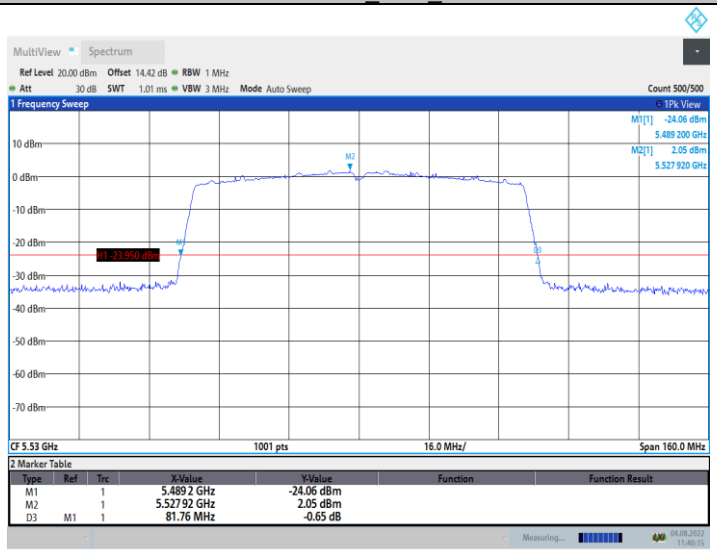

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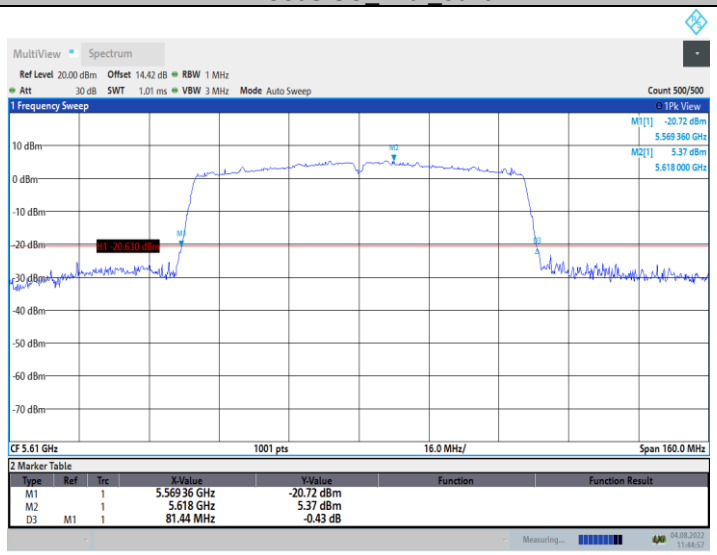

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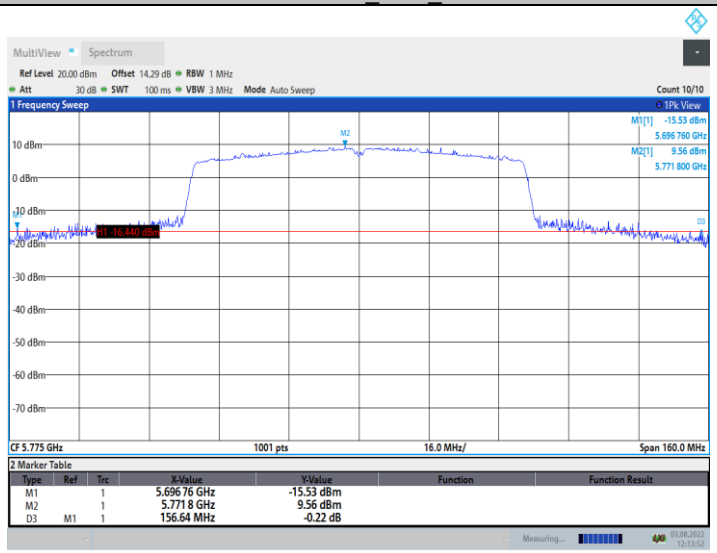

12:13:53 03.08.2022

8. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

8.1. Limits of Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.407 (a)
For the band 5.15–5.25 GHz.
For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the max-imum antenna gain does not exceed 6 dBi.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz,the maximum antenna gain does not exceed 6 dBi.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

8.2. Test Procedure

(i) Measurements may be performed using spectrum analyzer if all of the conditions listed below are satisfied.
The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.
(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g.,10 log (1/0.25) if the duty cycle is 25%) the measurement result.

8.3. Test Setup

8.4. Test Data

Table 11 Maximum Conducted Output Power Test Data

Test Mode	Test Channel [MHz]	Power [dBm]	Limit [dBm]	Verdict
802.11a	5180	14.13	<=23.98	PASS
802.11a	5200	15.05	<=23.98	PASS
802.11a	5240	14.76	<=23.98	PASS

802.11a	5260	14.10	<=23.98	PASS
802.11a	5280	14.11	<=23.98	PASS
802.11a	5320	10.59	<=23.98	PASS
802.11a	5500	12.06	<=23.98	PASS
802.11a	5600	16.66	<=23.98	PASS
802.11a	5700	12.67	<=23.98	PASS
802.11a	5745	17.07	<=30	PASS
802.11a	5785	17.10	<=30	PASS
802.11a	5825	17.06	<=30	PASS
802.11n HT20	5180	14.55	<=23.98	PASS
802.11n HT20	5200	16.39	<=23.98	PASS
802.11n HT20	5240	14.77	<=23.98	PASS
802.11n HT20	5260	15.59	<=23.98	PASS
802.11n HT20	5280	15.34	<=23.8	PASS
802.11n HT20	5320	11.32	<=23.98	PASS
802.11n HT20	5500	11.57	<=23.98	PASS
802.11n HT20	5600	16.58	<=23.98	PASS
802.11n HT20	5700	11.28	<=23.98	PASS
802.11n HT20	5745	16.23	<=30	PASS
802.11n HT20	5785	16.33	<=30	PASS
802.11n HT20	5825	17.07	<=30	PASS
802.11n HT40	5190	12.94	<=23.98	PASS
802.11n HT40	5230	15.31	<=23.98	PASS
802.11n HT40	5270	16.58	<=23.98	PASS
802.11n HT40	5310	13.26	<=23.98	PASS
802.11n HT40	5510	10.02	<=23.98	PASS
802.11n HT40	5590	16.60	<=23.98	PASS
802.11n HT40	5670	12.75	<=23.98	PASS
802.11n HT40	5755	15.51	<=30	PASS
802.11n HT40	5795	16.64	<=30	PASS
802.11ac VHT20	5180	15.03	<=23.98	PASS
802.11ac VHT20	5200	15.36	<=23.98	PASS
802.11ac VHT20	5240	15.50	<=23.98	PASS
802.11ac VHT20	5260	15.40	<=23.98	PASS
802.11ac VHT20	5280	15.49	<=23.98	PASS
802.11ac VHT20	5320	10.83	<=23.98	PASS
802.11ac VHT20	5500	11.61	<=23.98	PASS
802.11ac VHT20	5600	16.59	<=23.98	PASS
802.11ac VHT20	5700	12.22	<=23.98	PASS
802.11ac VHT20	5745	16.39	<=30	PASS
802.11ac VHT20	5785	16.35	<=30	PASS
802.11ac VHT20	5825	16.29	<=30	PASS
802.11ac VHT40	5190	13.56	<=23.98	PASS
802.11ac VHT40	5230	15.65	<=23.98	PASS
802.11ac VHT40	5270	16.29	<=23.98	PASS
802.11ac VHT40	5310	13.43	<=23.98	PASS
802.11ac VHT40	5510	10.09	<=23.98	PASS
802.11ac VHT40	5590	16.68	<=23.98	PASS

802.11ac VHT40	5670	12.94	<=23.98	PASS
802.11ac VHT40	5755	16.29	<=30	PASS
802.11ac VHT40	5795	16.20	<=30	PASS
802.11ac VHT80	5210	10.83	<=23.98	PASS
802.11ac VHT80	5290	12.99	<=23.98	PASS
802.11ac VHT80	5530	9.54	<=23.98	PASS
802.11ac VHT80	5610	12.69	<=23.98	PASS
802.11ac VHT80	5775	16.35	<=30	PASS

Note：The Duty Cycle Factor is compensated in the graph.